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THIS is the second time in one year that I have been honoured by being appointed to give a lecture to the medical profession and their friends. I have accepted, because those who invited me must know my limitations, and will not expect from me what I am obviously incompetent to give. In my Fison lecture at Guy's, a few months ago, I spoke of the philosophy of science, of the relation of philosophy, particularly the philosophy of religion, to science. Though my treatment of the subject was necessarily cursory, I could not give a second address on the same topic, especially as my lecture has been published; and so I have decided to take as my subject to-day one aspect of a branch of science in which I have been keenly interested for many years, ever since, as a near neighbour of Sir Francis Galton in Rutland Gate, I learned from that fine old man to feel some of his own enthusiasm about the possible improvement of the human stock. For me it has, of course, been a hobby rather than a rigorous study, and I should not dream of supposing that any utterances of mine on these abstruse and difficult studies can have any value as contributions to knowledge. They will deal rather with the borderland between strict science and practical social hygiene. Politics ought to be a branch of social hygiene, though at present social hygiene is hardly even a branch of politics. *Salus populi suprema lex*, as the proverb says; and we may give *salus* its commonest meaning of bodily and mental health. *Sanitas sanitatum, omnia sanitas*, is Disraeli's parody of Ecclesiastes. The subject of racial decadence is one of supreme public interest; and though I wish I were better equipped with technical knowledge, I hope I may be able to state the problem in such a way as to interest some of you.

NEGATIVE EUGENICS.

I have taken the negative side of eugenics rather than the positive, racial degeneration rather than race improvement, not because I have any natural tendency to dwell on the dark side of the changes which are always going on in the human race, but because at present negative eugenics is far more important than positive. We have to consider whether we can counteract the dysgenic effects of a highly artificial civilisation. Natural selection, in a humane and highly civilised country like our own, has almost ceased to operate; if we do not provide some rational substitute for it, Nature will punish us for interfering with her methods of social hygiene without providing anything to take their place. But I hope to give some striking examples of the inheritance of good as well as of bad characteristics.

"To understand what has happened, and even what will happen," said Buffon, "it is only necessary to examine what is happening." But when *ce qui arrive* is what we want to know, that which has happened is our best guide. All science is based on the belief that in natural laws "there is neither variableness nor shadow of turning." This does not exclude what Bergson calls creative evolution, Lloyd Morgan "emergent evolution," and chemists creative synthesis, though in this process there is an unexplained mystery. Biological progress means increasing complexity of structure and function, increasing specialisation and coöperation of parts; and what we call human progress is no more than this. Specialisation always means limitation in some directions. We cannot have both wings and arms (until we become angels); if our limbs are good for running we cannot swim like a fish. Highly differentiated organisms are fit only for certain conditions; when these are changed the organism must perish or return to a less differentiated type. It is only the least differentiated organisms, like the germ-cells, which are potentially immortal.

So there are different paths which evolution may take. In our species we may say that there have been three stages—greater complexity of bodily structure, greater intelligence, and greater social organisation; and it is broadly true that when a new stage begins, the earlier stage becomes less active. If we judge from other living organisms on the earth, stability seems to be the rule, change the exception; though De Vries thinks that periods of mutation and of stability alternate with each other. It is probable that the four ice-ages, divided by long inter-glacial periods, have had a great deal to do with the evolution of humanity. Perhaps Nature has expended nearly all her ingenuity; there have been no new classes since the appearance of mammals and birds in very early times.

Even social evolution seems to have come to an end with the bees and ants. State-socialism can no further go than in these suffragette utopias, governed and run by maiden aunts. These societies are an awful warning; perfect coöperation has sacrificed the individual completely. Fortunately, there are physiological limits to specialisation; men consisting almost entirely of swelled heads, like H. G. Wells's "Grand Lunar," could not live.

Man has been a distinct species for probably more than a million years, but anything like civilisation is a matter of the last ten thousand years or so. This is a very short time for him to adapt himself to revolutionary changes in his habits; we need not wonder that what Metchnikoff calls maladaptations or disharmonies, bodily as well as mental, exist to plague us in our health and conduct. I suppose that pathology is mainly concerned with such disharmonies; it is instructive to observe how very small a part disease plays in the lives of wild animals, which are completely adjusted to their environment.

It is sometimes said that evolution is rapid to start with, when some climatic or other change sets it going, and that it then slows down till it stops. But it seems doubtful whether physical changes are not now going on in our bodily structure as rapidly as ever; only unfortunately they seem to be mainly degenerative. H. F. Osborn enumerates the decreasing size of the little toe, increase in the size of the great toe; decrease in the size and strength of the teeth, and probably a gradual lowering of the perfection of the sense-organs. Dentists, I believe, agree that our jaws are becoming too small for our teeth; the sharp and narrow nose of the northern European may be a new feature, with some value as a protection against respiratory diseases; baldness in middle life is perhaps increasing; and something seems to be happening to that now useless organ the appendix. I believe additions might be made to this list. As regards the organs of sense, I cannot help thinking that our eyesight has deteriorated rapidly. Very few middle-aged men can read a closely written or printed mediæval book without glasses; though the ancient Greeks, a singularly long-lived race, went on reading and writing till extreme old age without mechanical aid.

Any physical changes other than degenerative are inhibited by the use of tools and other inventions. Digestion as well as mastication is made too easy; having clothes and weapons we need neither fur nor claws. And, as I shall show, nearly all the aptitudes which distinguish the handyman from the simpleton are now becoming superfluous. We may some day have a generation who can neither walk nor write; they will rely on the cycle or car for the first, and on the typewriter for the second. "You press the button; we do the rest." Nature will say, "Very

well, I will leave you just enough intelligence to press the button."

HAS HUMAN INTELLIGENCE ADVANCED?

It seems very doubtful whether human intelligence has advanced in the last five thousand years. Look at the Egyptians 3000 years before Christ. "Already," says Austin Freeman, "he is living in large and well-ordered communities with all the machinery of a complex civilisation. He has an established government, a system of jurisprudence, a complex religion, and a wealth of myths and traditions. Though unacquainted with iron, he is an expert metallurgist as to the less refractory metals, with the aid of which he works—and works magnificently—granite, porphyry, syenite, and other of the hardest stones. Not only can he smelt metal, he can work it in every way; draw it into wire, beat it into sheets, cast it, emboss, chase, engrave, and even inlay and enamel it. He has invented the lathe and the potter's wheel, and can make, glaze, and enamel beautiful earthenware. He is an expert woodworker, joiner, and carver. He is an admirable sculptor, draughtsman, and painter. He has developed a great architectural style, and his stone buildings are not only the greatest in size ever erected, but are of unsurpassed excellence of workmanship. He is a builder of sea-going ships of considerable burthen and is a capable coastwise navigator. He has invented the loom, and produces textiles of fine quality. He has a rich language, and has devised a system of written characters, the handsomest ever produced, with a convenient and practical cursive script. He makes excellent paper, and has an extensive, dignified, and beautiful literature. He has numerous musical instruments, including the harp, lute, viol, drum, sistrum, cithern, dulcimer, flute, recorder, trumpet. He has established something approaching a metal currency; has a number of weapons—sword, spear, bow and arrow, sling, boomerang; and has invented most of the hand-tools now in use. He has domesticated the ox, sheep, goat, horse, camel, dog, cat, pig, and various birds, and is an expert agriculturist. He makes furniture of unsurpassed excellence of design and workmanship, and can cut and polish precious stones and set them in beautiful jewellery—in short, he is already acquainted with the essentials of all the arts and crafts, and in many of them he is to this day unexcelled if not unequalled."

I will not go so far as Sir Francis Galton in estimating the comparative intelligence of the ancient Athenian and the modern European; but there can be little doubt that the Greek was our superior. All the great religions, and I think all the great philosophies too, were born in the thousand or twelve hundred years before the death of Mohammed.

Civilisation is mainly the result of accumulated knowledge and experience. Each generation stands on the shoulders of the last, and has the chance of climbing higher from that point. Most of our acquisitions are in the custody of a very few persons. Some of them are trade secrets; others can only be mastered by many years of application. This explains how civilisations occasionally die; it is also an argument for a widely diffused education. A great convulsion, like the breach of the dykes which protected the Græco-Roman world from the barbarians of the north and east, may break the tradition, and cause the total loss of the higher arts and sciences. It is well known that at the Renaissance it was necessary to go back to the fragments which had survived from classical antiquity. In medicine, for example, Celsus and Galen were far in advance of the superstitious and ignorant practice of the Dark Ages. It is unlikely, but not inconceivable, that such a disaster may occur again. In Russia the nation has been almost literally decapitated. When that nation recovers a civilised government, it will have to go to Germany and other countries for the arts and sciences which have been almost extinguished at home. A world-wide revolution of the same kind, such as might follow another great war, would be the end of our civilisation, and the beginning of a new Dark Age which might last for centuries. It might then be found that the present population of the world is less inventive and alert in intelligence than, for example, the Europeans of the Renaissance.

Analogy suggests that where the weight of sustaining civilisation is thrown upon tradition, other faculties, by which man slowly raised himself from savagery, are likely to become partially atrophied. Whether such atrophy can be inherited is, of course, a vexed question among biologists into which I, as an outsider, shall be wise not to enter. The problem is mainly about the manner of the changes conditioned by environment, for there is no doubt that a whale has lost its hind legs by living in the water. (Milton gives the whale gills and a trunk, but he was a poet.) But it cannot be disputed that those qualities which were once essential to progress have no longer the same survival value under civilisations of the modern type. An American eugenist, Holmes of California, sums up the differences between barbarism and civilisation as follows. Among primitive races, natural selection operates actively. Nomads are obliged to leave diseased and feeble members of the tribe behind on their long marches. Superstitious fear causes deformed children to be destroyed. Sexual selection frequently works for race improvement. The African chief, who monopolises half the women of the tribe and is the father of his people in the most literal sense, is usually a man of gigantic stature and strength, and of great vigour of character. Among the Chippewa Indians any one may challenge another to wrestle, and if he wins may carry off his wife as a prize. Savage war tends to an increase of the best stock, since the better fighter kills the worse. This I think is somewhat doubtful. "He who fights and runs away may live to fight another day." On the other hand, among civilised races, natural selection is reduced in some cases, and probably increased in others. In the upper and middle classes marriage is not universal, and though many of the best men and women unfortunately die childless, there is a certain selection against men who cannot make good as salary-earners, and against women who are not likely to make satisfactory mothers. But meanwhile, the State, and private charity, keep alive multitudes who by their misfortune or fault are lifelong parasites on the community, and who in many cases are suffering from heritable defects. This dysgenic selection affects a much larger number than the slightly eugenic selection among the well-to-do. Civilised war, says Holmes, eliminates the best. *Immer der Krieg verschlingt die Besten.* This is true, in so far as the unfit are not called to the colours. Such evidence as is available goes to show that considerable injury has been done to the European racial stocks by the Great War. Lastly, in place of the greater fecundity of the barbarian chiefs, the socially successful in civilised countries do not keep up their numbers. Against this it may be said that Plutus is blind, and does not always enrich the best, and that the children and grandchildren of the nouveau riche are not always better specimens of humanity than their poorer neighbours. But on the whole there is no doubt at all that industrial civilisation under a democracy skims off the cream in each generation and then throws much of it away.

The bees and ants have proceeded by extreme differentiation of function. The group has superseded the individual. Is this a desirable ideal for humanity? In some societies a highly cultivated minority has flourished and produced achievements which are the wonder of posterity, but the remainder of the population has remained quite uncivilised and uncared for. There have been biologists who accept this type of state as the best. Herbert Spencer thought that the "beneficent working of the survival of the fittest" must condemn the unsuccessful to "abject misery" and death. "An opposite régime would be fatal to the species." Haeckel says: "The theory of selection teaches us in human life exactly as in animal and plant life, that at each space and

time only a small privileged minority can continue to exist and flourish; the great mass must starve and more or less prematurely perish in misery. We may mourn this tragic fact, but we cannot deny or alter it. Many are called but few are chosen. This selection, this picking out of the chosen, is necessarily combined with the languishing and perishing of the remaining majority." Benjamin Kidd thinks that cut-throat competition "results from deep-seated physiological causes, the operation of which we must always remain powerless to escape." He adds that it is the lofty function of religion to furnish non-rational sanctions for conduct which make for social as opposed to individual welfare.

These sentiments are not likely to commend either biology or religion to those who used to be called the suffering and toiling masses. They represent a path which a nation might take, but, as I believe, to its own undoing. There are several fatal objections to it. Unlimited competition exhausts the competitors, physically and mentally, and in practice, whether voluntarily or involuntarily, it sterilises them. So severe is competition in America that 1,750,000 policy-holders of an insurance company (industrial department) give an average life of 46 years to males and 52 to females. Further, they will either destroy each other or cease to compete. In all the higher human activities competition is not the chief motive force, and in a nation organised solely for big business these higher activities languish. They are squeezed out, as we see in some sections of American society. The millionaire is not the supreme product of human progress. Again, as the result of our industrial régime, there has come about a correlation between failure and fecundity which is an odd comment on Herbert Spencer's beneficent law of the survival of the fittest. Lastly, the most important unit in group competition is the nation, and a nation organised on Haeckel's lines would go to pieces under the first severe strain, as Russia did in the Great War. Or if a privileged military caste made conquests, Nature's law is that the ruling race rules itself out. In Western Europe there are no more wolves; but the sheep hold their own. In short, I do not think that those who wish to keep the masses in a servile state (if there are any such left) can appeal successfully to biology in support of their views. A society with well-marked castes may be very successful, partly because, while encouraging good traditions of skill and requiring a considerable amount of specialisation, it mitigates competition; but not if it includes an ignorant and wretched proletariat. No scheme of social hygiene can be satisfactory that does not include the whole population. The plan of developing to the utmost a small selected class has been tried several times, but it is not proved that equally good results might not have been obtained by other methods involving less injustice.

SOCIAL SCIENCE AND ENVIRONMENT.

We have now to consider whether civilisation is working towards a degeneration of the national stock. We may ask first whether neglect of the known laws of heredity is producing this effect, and, secondly, whether our social arrangements are encouraging the tendency to parasitism, which is always ready to show itself where circumstances are favourable to it. We shall have to consider not only the parasitism of persons or classes on the community, but the new danger that human beings may become parasitic on the machines which they have made for their own use. This last is a source of racial decay which has only lately attracted attention. It is obviously a problem which belongs to the human race alone, since man is the only tool-maker.

It will be generally admitted that our social science has been too exclusively environmental. It is not necessary to minimise what can be done by external means, such as education, sanitation, and increased opportunities for leading a healthy life. Sometimes diseases which were supposed to be hereditary can be eliminated by scientific treatment, as the Swiss valleys have been almost freed from goitre, which was already prevalent there in the time of Juvenal, since that disease has been proved to be due to the absence of iodine; and the supposed congenital inferiority of the inhabitants of subtropical regions in America has been proved to be due to the parasite called the hookworm. It used to be supposed that Europeans were constitutionally unable to keep their health in a tropical climate. But it now seems that in the absence of tropical diseases, such as malaria and yellow fever, which are being brought under control by war against the parasites which cause them, even northern Europeans can live healthily in climates as hot as North Queensland. Still, when all has been said in favour of concentrating attention on the environment, the best authorities are unanimous that Nature is far more important than nurture. Prof. Punnett, for example, says that "permanent progress is a question of breeding rather than of pedagogics; a matter of gametes not of training. As our knowledge of heredity clears and the mists of superstition are dispelled, there grows upon us with an ever-increasing and relentless force the conviction that the creature is not made but born." It is surely significant that these judgments, which go beyond what the observation of life suggests to those who are not specialists in genetics, are maintained so strongly by those who have given their lives to this particular study. There is not much difference, I think, here between the Mendelians and the biometricians, who sometimes show a certain acerbity in criticising each other. Prof. Karl Pearson, the most prominent authority on the statistical study of genetics, comes to the conclusion that if we compare the relative importance of Nature and nurture in determining bodily and mental character, it is found that Nature is at least five times, and perhaps even ten times, more decisive than nurture.

It is true that the transmission of characters is now seen to be far more complex than was once supposed. It is usual now to speak of unit-factors, not of unit-characters. A character, such as marked ability in any direction, is probably due to the combination of several unit-factors, the absence of one of which may spoil the result. No one would claim that much is yet known for certain about the action of "genes" and the laws of their combined action. I could not think of offering any opinion on so abstruse a subject. But we may still learn much by collecting family histories, and observing what qualities tend to reappear in the second and succeeding generations, without even attempting to theorise on the causes of their transmission.

Pedigrees of able families are abundant, ever since Galton inaugurated this method of approach. I think, if I may venture on an opinion, that Galton hardly allowed sufficiently for the good start which the son of an able man has, the stimulating influence of the home circle in which he is brought up, the ambition of following in his father's footsteps, the opportunities of a good education which his father's success affords him, and in some professions, such as politics, the openings which the son of a Cabinet Minister may expect for entering public life, at an age when the member of a politically unknown family is still struggling on the lower rungs of the ladder. We shall also find, if we read the literature of the subject, that a small number of striking pedigrees, such as those of the Bachs, a family of able musicians, and of the Darwins in our own country, are repeated in almost every volume. We need a much larger number of pedigrees, including not only the five-talent but the two-talent men. There are, however, some characters, such as stature and longevity, in which adventitious advantages count for little. The inheritance of such characters is probably more instructive when we are investigating the incidence of heredity than the history of families of great distinction. There is much material of this kind in the valuable but unfortunately very expensive periodical, *Biometrika*. Davenport gives some striking examples of the inheritance of stature and longevity,

which indeed we must have all observed. Insurance companies, it is well known, ask particularly about the ages at which the applicant's four grandparents died. In one American family mentioned by Davenport, the father died at 91, the mother at 82. There were 17 children, of whom the shortest lived died at 67. The inheritance of high stature cannot have escaped our notice. It would be quite easy to breed a family with an average height of over six feet by selected matings.

Mendel's discoveries have perhaps affected Galton's law of "reversion to the mean." Such reversion usually takes place, but if matings were selected with a view to preserving some particular character, I see no reason why it should not be firmly established. There is no tendency to breed out a degenerative variation which has once appeared, unless it kills off its victims.

HEREDITARY ABILITY.

Are some kinds of ability more strongly inherited than others? I believe myself that no kind of ability is more strongly inherited than that which leads to academic distinction in "humane letters," but that mathematical talent is comparatively sporadic. In classical scholarship the record of such families as Butler, Kennedy, Sidgwick is very remarkable. I gave in one of my books the history of my own mother's family, the Churtons. The first scholar of the family, my great-grandfather, was something of a freak, since his father was one of the old yeoman farmers, cultivating his own land. But as usual, for better or worse, the freak was persistent. In four generations no male of the family who lived to grow up failed to win more or less distinction as a scholar or theologian or both. There are 13 names in the list. Such records give point to the question of St. Paul, "What hast thou that thou didst not receive? But if thou didst receive it, why dost thou glory as if thou hadst not received it?" It would be a great comfort if we could apply the same argument to our faults. There are some professional families much more distinguished than mine, such as the Wordsworths, Selwyns, and Pollocks, whose history would be well worth tracing in detail. In fact, I believe that if, say, a thousand professional families would draw up records of this kind, it would have a real scientific value. I have suggested to the Eugenics Society that they might announce their willingness to receive family histories.

A very important question, especially as bearing on the subject of this lecture, is whether the professional classes have really a much higher average of innate ability than what, without meaning any offence, we may still call the lower middle and lower social strata. Political prejudices ought not to be allowed to interfere with a purely scientific question. The best discussion of the subject that I know of is in McDougall's "National Welfare and Decay." McDougall, who is now professor of psychology at Harvard, has a reputation second to none as an authority on social psychology. He considers that for the British people at the present time the topic of racial deterioration "overshadows and dwarfs every other that any man of science could propose for its consideration." "Both these great nations" (Britain and America) "are threatened by an insidious danger which, if we cannot learn to cope with it, will bring our brightest hopes to nothingness, and render our ideals merely the fleeting visions of a golden age which is past." The Great War has taught us that civilisation and culture do not necessarily sap the energies of man; this is a most reassuring discovery. Our future is in our own hands to make or mar. History seems to show that in the rise and fall of peoples economic factors are of secondary importance; no advantages will save a people from decay when it loses its natural superiority. Nations do not grow old like individuals; that is a false analogy; but they do die of disease, when the burden of civilisation becomes too heavy for the shoulders which have to bear it. This is why the present situation is so serious. The higher races and classes are using the resources of scientific knowledge to reduce the death-rate of the inferior and the birth-rate of the superior. In the United States a competent investigator says, "All available data combine to prove that the Anglo-American population has not merely attained its maximum, but has begun to decline." Prof. Karl Pearson, whom no one will accuse of being a Tory, says:—

> The upper middle classes are the result of a severe selection of capacity, and later, of intermarrying, under conditions which seem no longer possible. . . . It is the realisation of these points, that not all, but the bulk of the abler and more capable stocks have drifted into the upper middle class, and that ability is inherited, which makes, in my opinion, the decreasing relative fertility of these classes a matter of the most serious national importance.

This was written as early as 1905. In view of the financial burdens heaped upon the professional class since the war, it is certain that the situation has become very much worse. If you will take the trouble to open "Who's Who" at random, and count the number of children in 50 or 100 consecutive entries, you will find that they are slightly less than two to each entry; so that these families of moderately successful men are not keeping up their numbers.

But have we any direct evidence that the children of the upper middle class are better endowed by nature than the other strata which, as we have seen, are crowding them out of existence? I will give two quotations from McDougall's book:—

> "Some years before the war, one of my pupils at Oxford made a direct attack upon the problem, and the results are significant, though on a small scale. At Oxford are gathered as teachers many men from the whole British Empire, highly selected in virtue of intellectual distinction. Now it so happens that in a certain private school in Oxford a majority of the boys are sons of these men. We therefore set out to compare the intellectual capacity of the boys of this school with that of boys of a primary school. This primary school was an exceptionally good school of its kind, the teaching being in many respects better than in the other, the private school; the boys were from good homes, sons of good plain citizens—shopkeepers, skilled artisans, and so forth—and there was no question of their development having been retarded by physical privations. Without going into detail, I may say summarily that the result was to show a very marked superiority in the boys of the school frequented by the intellectual class. The result is all the more striking if you reflect on the following facts: first, every boy has two parents and inherits his qualities from both. Secondly, it has not been shown that university dons prefer clever wives, or that they are particularly clever in choosing clever wives. It is highly probable that if the wives were all as clever as their husbands, the superiority of their sons would have been even more marked."

My other quotation concerns America.

> "Mr. A. W. Kornhauser examined 1000 children, drawn from five schools of the city of Pittsburgh. Of these schools, A and B were attended chiefly by the children of the poorer classes, largely unskilled manual workers; C and D by children of a more prosperous class, largely skilled artisans and small shopkeepers; E by children of parents in very comfortable circumstances. He found that the groups from A and B show a very large proportion of retarded, with an almost negligible number of advanced; C and D have the most nearly normal proportion of retarded and advanced; the E group shows a very small proportion of retarded, with a comparatively large percentage of advanced pupils. If the several schools had had the same standard of grading, the superiority of intelligence in the children of E over the others would be revealed even more strikingly. The figures are—in A, retarded 45·2 per cent., normal 47·1 per cent., advanced 7·7 per cent. In E 12·7 per cent. retarded, 62·7 per cent. normal, 24·6 per cent. advanced."

McDougall considers it proved that "the social stratification which exists in modern industrial communities is positively correlated with a corresponding stratification of moral and intellectual quality, or in less technical language, the upper social strata as compared with the lower contain a larger proportion of persons of superior natural endowments." He goes on:—

> "Forms of organisation matter little, the all-important thing is the quality of the matter to be organised, the quality of the human beings that are the stuff of our nations and

societies. . . . Civilisations decay because they die off at the top, because they cease to produce in sufficient numbers, men and women of the moral and intellectual calibre needed for their support. . . . The number of such persons is becoming absolutely fewer with each generation; the evidence is overwhelming."

I should not myself be quite so dogmatic as this last sentence; the question is too difficult to answer confidently. But several modern tendencies are actively dysgenic. The relative sterility of the professional class is a new thing. The sharp decline in the infant mortality of the slums is a new thing; the educational system whereby in each generation the cream of working-class ability is skimmed off and drafted into the infertile black-coat professions, is new; the feminist movement, which according to some is the most dangerous of all, by making the most intellectual women disinclined to marriage and motherhood, is new. The extent of the evil may be and has been very variously estimated; but beyond all question the classes which are the best endowed intellectually (and, in this country, the best endowed physically as well) are passing into a relative and even an absolute decline. At Oxford, McDougall found that 142 dons had 261 children—284 parents, 261 children. Taking the country as a whole, though the figures are somewhat contradictory, the lowest birth-rates seem to be those of the medical profession, the teachers, and ministers of religion. My present audience will probably agree that no more desirable parents of the next generation can be found than the members of these three professions. It may also suggest food for reflection that these three professions are the chief denouncers of birth control. We have seen what our leading authorities on Mendelism and Biometrics think of the immense importance of preserving the best stocks and repressing the increase of the worst. There is therefore grave reason for apprehension at the course which our civilisation is taking.

Before leaving the subject of good heredity, and passing to the darker side of my theme, I should like to call your attention to one of the most remarkable examples of the way in which a country may be permanently enriched by a very small accession of picked immigrants. To judge from the claims of some prosperous Americans, one might suppose that the *Mayflower* was as large as the *Olympic*. In point of fact, it was a very small vessel, and the mortality among the Pilgrim Fathers was so great that only 33 of them founded families. Nearly half the great men of America are the authentic descendants of these 33 men. Here is the list, as furnished to the last Congress of Eugenics:—

John Adams, President; John Quincey Adams, President; C. F. Adams, Ambassador to Great Britain; H. Dearborn, Secretary for War; Garfield, President; Ulysses Grant, President; L. P. Morton, Vice-President; Elihu Root, Secretary of State; A. Taft, Attorney General; W. H. Taft, President; Zachary Taylor, President; E. B. Washburn, Secretary of State; Daniel Webster, Secretary of State; L. Wood, Governor of Cuba and the Philippines; Lord Lyndhurst, Lord Chancellor of England; M. W. Fuller, Judge of the Supreme Court; W. C. Bryant, Poet; W. Churchill, Novelist; R. W. Emerson, Philosopher; H. W. Longfellow, Poet; with many other names less well known on this side.

IMPAIRMENT OF THE NATIONAL STOCK.

I now come to the injury which is being done to the national stock by the unchecked propagation of inherently bad stocks. A combination of socialism in distribution with laissez faire in procreation is a policy only fit for Bedlam. The importance of prenatal infection is often exaggerated, partly for moral reasons. I once asked Sir Conan Doyle whether as a doctor he could justify the plot of his lurid story, "Unto the Fourth Generation," and he admitted that he could not. It seems very doubtful, in spite of the researches of my friend Dr. Mjoën, of Norway, whether alcohol injures the germ-plasm. Sir Archdall Reid even suggests that after a century or two of prohibition a nation would be in an admirable state for general alcohol poisoning; the effects of immunisation would by that time have worn off. The danger to the stock comes from those diseases which when they have once appeared in a family, Mendelise, and are never bred out of it, though the curious law of "antedating," which seems to be established in some cases, looks like an attempt of nature to cut off the tainted entail.

I will take first the case of mental defect. The feeble-minded are about 50 per cent. more prolific than the normal. The researches of Tredgold are decisive on this point. Where two feeble-minded persons marry, the children are all tainted. Pedigrees may be found in Tredgold, Whetham, Davenport, and many other writers. In one family tree, planted by two defectives, there are 14 names, none of them normal. Holmes says:—

"Out of 482 children recorded by Goddard as arising from unions between two feeble-minded persons, 477 were known to be defective. . . . In 41 such matings of the 'Kallikak' family, there were 222 feeble-minded and only 2 normal."

Where one parent is epileptic and the other feeble-minded, Davenport and Weeks found that in 15 matings, 28 out of 55 children were epileptic, 26 feeble-minded, and 1 insane.

Insanity is, of course, a word which covers many diseases, and I am not suggesting that all insanity is degenerative. But it is ominous that—

"in 13 years before 1903 the insane in institutions in the United States increased 100 per cent., and that since 1859 in England and Wales the insane have increased 230 per cent." (Holmes).

These figures do not include the mentally deficient, who have multiplied as we should expect.

It is not generally known that though the death-rate has declined rapidly and steadily till it must have almost touched bottom, the saving has been entirely in the earlier periods of life. The expectation of life at 60 is, I believe, no higher than it was 70 years ago. Some microbes seem to be in process of establishing a *modus vivendi* instead of a *modus moriendi* with their hosts, but cancer begins after 45 to levy a cruel toll upon both sexes, and now nearly equally, though it was formerly more fatal to women in the proportion of 5 to 2.

Some of the most striking instances of heredity in disease are in somewhat rare ailments, which have not very much racial importance. The incidence of albinism is so curious that it probably results from a combination of two or more factors. In one family there were 19 albinos out of 75 in four generations; but it seldom appears so frequently as this. Night-blindness and colour-blindness are both, it seems, inherited with a greater intensity than can be accounted for by Mendel's law. Two marriages between deaf mutes produced nine children, all deaf and dumb. A third marriage between two deaf mutes produced four children, all deaf and dumb; but one of them married another deaf mute, and had two normal children. Hæmophilia is usually supposed to be absolutely sex-linked; for which reason I should be interested to know why the Registrar-General passes, apparently without investigation, the attribution of a few deaths of females to this cause.

A more interesting question for most of us is whether the national physique is improving or deteriorating. A Danish savant proved at the last Eugenics Congress that the stature of Danes has risen very appreciably in 50 years, the figures being 165·42 cm. in 1852–56, and 169·11 cm. in 1904–05. The average height of the Dutch has risen from 165·5 cm. in 1866 to 168 in 1899. In France the average height of women is said to have risen 3 cm. in 80 years. The only English figures of the same kind that I know of are measurements at Marlborough College, which showed, in boys between 14 and 15, an increase from 61·4 inches in 1874–78, to 61·96 in 1899–1902.

It is difficult to reconcile these favourable statistics with an article published last year in the *English*

Review, giving very disquieting figures about our own country.

Grade A 1917–19.	Average.	Whole country 1883 (Anthropometric Committee of Brit. Assoc.).
Height, 66 in.	65·7	67·4
Chest, 34 ,, ...	32·5–33	36·4
Weight, 130 lb.	128·4	148·7

In boys of 18 the height is said to be less by 1·6 inches, the chest by 0·3, the weight by 11·6 lb. The same article states that in 1924 the Commissioners of Constabulary reported a general deterioration in the nation's physique. The chief constable is lucky if he finds five suitable men among a hundred applicants.

I should be much interested to know whether the facts in this article have been challenged. If they are true, they are, it seems to me, exceedingly serious, especially as our neighbours on the continent do not appear to be suffering in the same way. The decline is far too great to be attributed to malnutrition during the years of the war.

There is another way, besides dysgenic selection, in which the national stock may be impaired. Nature, we were told long ago, takes away organs which are not used. I suppose the statement is broadly true, whatever the method may be. The free-moving creature which becomes a parasite drops all its organs except those which enable it to hang on and suck. In one of the most interesting books of recent years, "Social Decay and Regeneration," by Austin Freeman, which I have already quoted, the thesis is maintained that the invention of the power-engine marked an epoch in the history of mankind. Ever since the growth of the machine age there has been a destruction of natural beauty, a reckless squandering of irreplaceable natural resources, and a progressive loss of all the exquisite works of skill wrought by the human hand. The old handicraftsman was in every way a superior and more civilised animal than the minder of machines. Machinery has transformed a skilled into an unskilled population. The modern workers are parasitic on the machine which has ousted them from natural human occupations; apart from the machine they would be helpless even in the presence of abundant material; a company of such men, left to themselves, would either perish or exist miserably as savages. Together with this disastrous change we see the growth of anti-social movements; we see hatred of civilisation itself; we see whole classes banded against society, and determining to be parasitic upon it; we see increasing multitudes accept permanently the position of pure parasites—dole-receivers; we see the industrious producers harassed and plundered more severely every year. This picture is filled in with a great wealth of detail. The indictment is very difficult to rebut; and the diagnosis is the more grave because the disease seems to be constitutional, the inevitable result of changes which could not be resisted. Society may become like the majestic sunfish—its scales covered with lice, its intestines one tangled mass of tapeworms, its eyes pierced by trematodes, no organ of its body free from swarming masses of parasites. And it may not be easy to recall the parasites to healthy social habits. *Facilis descensus Averni ... sed revocare gradum ... hoc opus, hic labor est.*

CONCLUSION.

Nevertheless, I am inclined to think that it is not too late to stop the mischief, which has not yet had time to go very far. We must hope that social antitoxins will somehow be generated, and that we shall not steer the ship upon the rocks with our eyes open. We are not yet a degenerate people; we are a race to which any man might be proud to belong. But we are not at present in a healthy condition, and unless we take the problem of racial decay in hand promptly it may be too late. I only wish I had more practical suggestions to offer. Mr. Austin Freeman attempts some at the end of his book, but they seem to me very impracticable. All we can do at present, I think, is to persuade our countrymen what the pressing problems really are. They are so very different to those in which our precious politicians interest themselves.

The great medical societies can do much, if they will speak out. I do not think they quite realise how glad the public would be to listen to them. The modern man may deny that he has a soul, and forget that he has a mind; but he is acutely conscious that he has a body, and therefore he has a great respect for the doctors. I wish they would testify, for I nearly always agree with them.

TWO PAPERS ON
BRONCHIECTASIS:
RECENT ADVANCES IN TREATMENT AND DIAGNOSIS.*

I.—FROM THE MEDICAL ASPECT.

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BRONCHIECTASIS, if we may call it a disease, is certainly a very protean one; as varied, indeed, in its clinical manifestations and therapeutic demands as is pulmonary tuberculosis itself. This is understandable when one recognises that its essential quality—bronchial dilatation—is the end-product of a multitude of disease processes; that it may attack many or few bronchi, and these of various sizes; that it may be unilateral, or affect both sides of the chest; that the surrounding lung may be healthy, inflamed, or fibrosed; and also that the dilated tubes themselves may remain comparatively healthy, be subject only to catarrh, or may be the seat of a severe suppurative process. It is this last condition, bronchiectasis with suppuration, which I think we must have especially in mind in our discussion to-night, since it is here that diagnosis and treatment are in most urgent demand, and here, consequently, that new methods have arisen and demand our consideration.

For our present purpose, I think, cases of clinical bronchiectasis may be said to fall into two main groups: 1. The slighter cases, especially seen in childhood, mostly involving small bronchi or bronchioles, and with mild or intermittent symptoms. 2. The more serious cases, mostly found in adults, though frequently originating in childhood, where symptoms are continuous and severe (though often with intermissions at first), and where the condition finally amounts to a suppuration within the dilated and thickened tubes. A third place might be given, perhaps, to certain cases of lung suppuration where bronchiectasis is an accompaniment of abscess formation, the result, in most cases, of aspiration of a foreign body, generally broken tooth, wool plugs, or septic materials, during a tonsillectomy or tooth extraction. These cases of "bronchiectatic lung abscess," as they have been called, are so important in practice that they may well be included in our present discussion, since bronchiectasis is one of their features.

Now before I turn to the serious cases of bronchiectasis with suppuration, which I take to be our main thesis, I should like, if I may, to say a few words about the cases of slighter disease. As a physician attached to a children's hospital I am brought in contact with numbers of these cases, and my first interest in bronchiectasis was aroused by them to the extent of collecting and publishing a paper on 40 cases as long ago as 1905. Their importance lies in the fact that they are potentially serious, that their recognition and study may give the clue to adult chest disease, and that they help us to understand how bronchiectasis is brought into being. Often it is possible to detect dilatation of bronchioles

* Opening a discussion on Nov. 22nd before the Medical Society of London.

after an attack of broncho-pneumonia, and to watch the child through subsequent attacks into a condition where a permanent fibrosis and bronchiectasis is left at the lung bases, generally more marked on one side than the other. The symptoms of these cases, and the severe catarrhal attacks to which they are subject often, I think, where the structural changes are moderate, abate with growth, and hence a proportion of these cases drop out of view, and only the more serious ones carry their disability visibly into adult life. This accounts, I think, for the fact that these cases if looked for are observed more commonly in the first decade than at any subsequent period, though presenting for the most part much less serious symptoms. The slighter of them are mainly of importance in that their physical signs may form the basis for a mistaken diagnosis, and that they may appear in adult life, the childhood condition being forgotten, under such guises as basal bronchitis, purulent bronchitis, and broncho-pneumonia in the adult, or with such unexpected symptoms as blood-stained sputum, or even a frank hæmoptysis. This condition of "damaged lung" is generally basal in the broncho-pneumonic areas, but it may, rarely, follow an upper lobe pneumonia, generally on the right side, and is then very apt to be mistaken for pulmonary tuberculosis. How far modern methods, such as lipiodol, will come into use in the differential diagnosis of these slighter conditions it is difficult to say.

More serious examples of bronchiectasis, those indeed which mainly concern us to-night, may begin in childhood, and only become serious with the passage of time, or may arise in adult life from causes often somewhat obscure. On the one hand, they may arise from inflammatory conditions which weaken the bronchial wall as from bronchial suppuration, or influenzal congestion or pneumonia, a common cause in recent years. They may develop also as a result of pulmonary fibrosis. On the other hand, serious bronchiectasis may be due to bronchial obstruction, whether within, from foreign bodies, or strictures, congenital or syphilitic, or from pressure without by neoplasm, aneurysm, or diseased glands. Under all these circumstances the symptoms and severity of the case vary greatly with the following conditions: (1) the amount and nature of the bronchial dilatation; (2) the adequacy of drainage; and (3) the severity of the infection present in the deformed tubes. With regard to (1) and (2), it is obvious that, on the one hand, an area of dilated bronchioles will be of no great consequence unless as a nidus for catarrhal attacks, whereas a lobe riddled with thick-walled dependent cavities, insufficiently drained by a narrowed bronchus, is likely to prove a very different proposition. But it is the nature of the infective process which especially determines the course, whether serious or otherwise, of the case. Even with considerable bronchial dilatation a patient may be kept in comparative health and comfort for an almost indefinite period, providing no severe infection of the unhealthy area arises. Owing to imperfect drainage a condition of chronic catarrh is maintained, sputum is probably abundant, and if treatment is neglected, perhaps occasionally offensive, but health may be fairly maintained and the expectoration remain the patient's chief trouble. But replace this catarrhal condition with a severe suppurative process and the case enters a different category. Bronchial drainage may altogether fail to relieve, and surgical intervention appear necessary to treat what is, after all, a surgical disease, though invading the lung, one of the last strongholds of the physician.

Diagnosis.

In the diagnosis of bronchiectasis two recent advances claim special notice—namely, bronchoscopy and the injection into the bronchial tubes of substances, such as bismuth and iodine preparations, which are opaque to the X rays.

Bronchoscopy.—The increasing use of the bronchoscope in the differential diagnosis of bronchiectasis may be traced to the activities of the American school, notably to Chevalier Jackson. In the elimination of foreign body, or of stricture, or obstruction as a cause (with due care in the avoidance of its use in cases of aneurysm), and in the determination of the extent and location of the trouble, the patency of the affected bronchus, the presence of granulations, &c., this method becomes of increasing importance. Bronchoscopy has become in America a specialty apart from laryngology, due, no doubt, to that curious foreign-body-in-a-bronchus habit of the American people, and has reached a stage of skill where no more than a local anæsthetic to throat and epiglottis is generally needed for its use, even in childhood. W. F. Moore, of Philadelphia, treating 38 cases of bronchial suppuration by weekly aspiration and lavage, was able to record that, though no general anæsthetics were used, not one case refused to carry through the course of treatment.

Bismuth and Lipiodol, &c.—At the end of a bronchoscopic examination it has been the practice of Chevalier Jackson to insufflate bismuth and radiograph the chest. Where the bronchoscope is not in use the simplest plan is to inject 20 c.cm. of lipiodol through the crico-thyroid membrane following anæsthetisation of the trachea with some 5 per cent. cocaine. If a needle only three-quarters to one inch long is used, the warmed lipiodol is easily injected under hand pressure without the screw arrangement often recommended. The needle must be kept sharp or the tracheal mucous membrane may be pushed before it. At any rate, I have seen failure to reach the tracheal lumen and that seemed the only possible explanation. I shall not here deal with lipiodol in diagnosis since I know it will be adequately discussed by others. All I would like to insist on is the useful attention it is directing to the value of postural X ray examinations now fluid levels can be so easily followed, and also to the occasional value of the lateral, as opposed to the oblique radiogram in diagnosis. In addition, it is interesting that lipiodol shadowing is visible in some cases as long as four months after its introduction, and that Forestier, of Aix-les-Bains, holds that remedial effects follow its use in bronchiectasis. These are points for further investigation. It will be remembered that intratracheal injection, mainly of menthol and guaiacol in oil, formed a treatment of the past, but was not followed by any very striking results.

Conservative Treatment.

In the days when the chest was still the undisputed property of the physician, before ever the surgeon began to look in at the door, cases of bronchiectasis, treated on common sense lines, often did remarkably well, and they still continue to do so. But recently I have been shocked to see, in an article on the treatment of bronchiectasis by a distinguished surgeon, under the subheading Medical and Hygienic Therapy, the words "This is without effect." Evidently it is time for the physician to reassert himself! In practice one may say, I think, that the ordinary treatment used by physicians in the more recent past, if persisted in by the patient, gives adequate and satisfactory results in a majority of cases. It is well to recognise at the outset that the anatomical condition bronchiectasis, once established, is incurable, but that nevertheless good health may be maintained in many cases in spite of it. It must not be supposed that removal or elimination of the diseased area is necessary or possible except in a few cases, and the number suitable for surgical measures is really comparatively small. Even the surgeons, as a rule, display no undue enthusiasm. Hedblom, of Rochester, U.S.A., refers to these cases as "the most thankless task in surgery." Sauerbruch, who had operated on 69 cases up to 1920, says "The surgical treatment of bronchiectasis is the most difficult and thankless chapter in the whole of lung surgery." Evarts Graham, whose surgical work in bronchiectasis we shall mention later, finds that he operates on fewer and fewer cases; he was content to treat 24 of 40 cases in children by ordinary conservative measures. These measures must now be referred to.

Postural Drainage and Creosote Chamber.—Only two of them are of outstanding importance, and we may let the rest go by the board to-night. I refer to postural drainage, and the creosote chamber treatment introduced by Arnold Chaplin in 1895. With these two properly applied, where bronchial drainage is free, we can bring to clinical recovery and keep in comparative health the majority of cases of bronchiectasis, and that without danger to life. Unfortunately, human nature being what it is, it is very difficult to avoid relapses through neglect of treatment. Life, as we know too well, is apt to become as years advance "just one darned thing after another" and it is scarcely surprising, perhaps, that patients resent, and after a time neglect, any addition to the daily ritual. Other methods of treatment, including surgical measures, come into consideration only where postural treatment and creosote chamber fail or are inapplicable, or where the patient demands some release, even at danger to life, from the burden of a somewhat hampered existence. Then must we consider, one by one, the means which modern progress has prepared for us. Let us take a problematical patient and consider the lines on which we should deal with him.

Often we find our patient propped up in bed and overflowing with secretion like a full jug. He has avoided movements which bring on cough and so his secretion has accumulated. The first process will be to empty him out gradually till he can lie flat, and thereafter, as his condition allows, begin postural drainage in the knee-elbow position, and later over the side of the bed, and, presently, if the case appears to be an ordinary bronchiectasis, the creosote chamber. In the meanwhile radiograms will be obtained whereby we can ascertain where the trouble is situated, whether there is any question of neoplasm, aneurysm, foreign body, or abscess formation, what amount of fibrosis is present, and, if necessary, with the assistance of lipiodol, what is the nature of the bronchiectasis, and how far, if at all, it affects the opposite lung. For of 318 cases observed in the Rochester Clinic, U.S.A., 28 per cent. were bilateral, and in another 38 per cent. the condition of the second lung remained uncertain. Among 54 autopsies in bronchiectasis Lebert found 52 per cent. unilateral and 48 per cent. bilateral.

Now under postural drainage and creosote vapour in many cases the sputum will lose its offensive odour and much of its purulent character, and become greatly reduced in volume, the patient's toxic condition will clear up, and an extended trial of these measures will be indicated, especially if disease is bilateral. If, however, there is question of a foreign body or of abscess formation, or the symptoms date from an operation, especially a tooth extraction or tonsillectomy; if there is suspicion of bronchial obstruction other than aneurysm; or if drainage seems hampered and the sputum remains offensive, and general improvement is slow, then a bronchoscopic examination may help to clear up both diagnosis and treatment.

Bronchoscopic Treatment.—The bronchoscope in diagnosis we have already mentioned; it may also be helpful in treatment. Foreign bodies may be found and removed, foul pus evacuated by aspiration, strictures dilated and granulations cauterised. Weekly bronchoscopic aspiration, assisted in some cases by lavage and medical applications to the bronchial walls, has proved of value, especially if used early (T. McCrae)—it will not, of course, cure chronic bronchiectasis any more than will postural or any other form of drainage, but it will help to restore health. Nevertheless, among W. F. Moore's cases of bronchial suppuration so treated a third showed no improvement. "The unimproved class," he remarks, "was chiefly made up of patients with extensive bronchiectasis." Thus a proportion of cases will be left for the trial of other more radical measures.

More Radical Methods of Treatment.

These have for aim the development of one or more of the following principles: (1) Improvement of drainage. (2) Closure of suppurating cavities by collapse or compression of the surrounding lung. (3) Extirpation of the diseased area. These further measures are all, except external drainage, of modern development, and may be considered under the following headings: pneumotomy, artificial pneumothorax, phrenic exairesis, thoracoplasty, ligature of pulmonary artery, and lobectomy and cautery lobectomy.

Pneumotomy.—External drainage has been attempted in the past, and mostly abandoned for ordinary bronchiectasis since a single opening fails to drain multiple cavities, and may greatly interfere with the efficacy of cough in clearing the chest. Only where suppuration has gone on to softening and the formation of a single large sac, a bronchiectatic abscess, is open drainage likely to prove successful, and such an opening, unlike that for simple abscess, will not again heal spontaneously. Nevertheless, the improvement which follows in suitable cases may reconcile the patient to the inconvenience of an open fistula which at a later stage may require but a single dressing daily. Such a fistula can be closed at a later date, though this is, probably, seldom advisable, or further operative measures may be added. Sauerbruch, collecting the literature up to 1911, found 123 pneumotomies recorded with results: 33 per cent. cured, 6 per cent. improved, 27 per cent. unrelieved, and 25 per cent. dead. The results in the hands of different surgeons differed widely, probably according to the suitability of the material chosen for the operation, some achieving great success and others decidedly the reverse. It seems probable that a proportion of the successful cases were lung abscess rather than bronchiectasis, since little trouble has been taken in many quarters to differentiate between these two conditions. Clearly the success or otherwise of external drainage is bound up especially in the recognition of the suitable case.

Artificial Pneumothorax.—This treatment, whose purpose is the closure of the suppurating cavities by collapse or compression of the lung, can only come into consideration when disease is wholly or mainly unilateral, and even then it is open to certain serious difficulties.

1. When one considers the post-mortem appearances of the disease it is obvious that in a majority of the bad cases no real collapse of cavities is possible, and this is found to be the case in practice. Pneumothorax is best suited to certain post-pneumonic cases in developing stages—that is, in early life—since in these the smaller and thin-walled bronchi are at fault. It is but little applicable to the old advanced cases of adult life where the larger tubes are affected, and these are the very cases for which treatment is especially needed.

2. For the reason just given only a very complete collapse is likely to succeed and this is just what, in bronchiectasis, is very rarely attainable. Adhesions are generally numerous and strong, and Burrell records good collapse in but two among his 19 cases. Now the presence of these adhesions brings us to the third difficulty.

3. Are they not themselves evidence that a spread of infection to the pleura is common in these cases, and such a pleural infection occurring after the lung is collapsed means a pyopneumothorax of almost certainly fatal issue? This has happened in my own practice, and I have become very cautious of advising pneumothorax on this account. Still, the treatment is probably, in spite of this risk, the best that can be done in certain cases, especially in early life, and if complete collapse is attained the risk of pleural infection may be much diminished thereby. It must be remembered that pneumothorax treatment is in this disease only palliative, and that the cavities reopen if the lung is allowed to re-expand, though the suppurative process may by then be mitigated or suppressed. In gauging the effects of pneumothorax on the bronchiectatic area it is useful, as is well shown in some plates published by Burrell and Melville, to inject lipiodol into the lung before the pneumothorax is initiated.

Phrenic evulsion or exairesis has been used of recent years in the treatment of basal bronchiectasis. The paralysed diaphragm rises into the chest and the base of the lung collapses, the effect being especially pronounced where the right nerve is treated. It might be thought that expectoration would be thereby hindered, but in practice the opposite generally occurs. Thus among 40 cases operated on in the Sauerbruch Clinic, Lange found that in 23 expectoration was facilitated, in eight there was no change, and not one complained of difficulty. The explanations suggested by J. Alexander for this improved power of expectoration is that the abdominal muscles during cough can exercise a more direct propulsion on the lung through the paralysed diaphragm. Cases have been reported where phrenic evulsion has led to improvement in bronchiectasis, but personally I have not been impressed in the cases where I have tried it, nor can it be expected to accomplish very much.

Thoracoplasty.—Paravertebral thoracoplasty, performed with such success in selected cases of pulmonary tuberculosis, has proved much less valuable, as would be expected, in bronchiectasis. Here the thickening and stiffness of the bronchial walls, and often of the surrounding lung, prevents closure of the cavities even under pressure by a pneumothorax, and mere reduction of lung volume by thoracoplasty will effect even less. Among 27 cases of disease involving the whole of one lung operated on by Sauerbruch, none were cured and only five permanently benefited. There was only one death among these cases. On the other hand, he records better results in a further 11 cases where the trouble followed empyema and was confined to the lower lobe. More recently Hedblom has treated ten cases, with no death and with considerable improvement in most, by a more extensive but graded thoracoplasty confined to the lower part of the chest. The operation is done in four or five stages under local anæsthesia and the outcome is the removal of practically the whole of the fourth or fifth to eleventh ribs, beginning with the paravertebral region, continuing with the sternal ends, and finally removing the mesial portions. The collapse is thus rendered very complete, but his patients, he says, are up and out of bed two or three days after each operation; nor has he anything to say about "flapping" or "fluttering" of the mediastinum, which was so serious a feature of the extensive Brauer-Friedrich operation of old days. This is probably avoided by the multiple-stage procedure, but it is difficult to suppose that many patients in this country could be induced to undergo five resection operations under local anæsthesia. A thoracoplasty adequate to the improvement of bronchiectasis must necessarily be a severe operation, and personally I feel there are very few cases where it seems justified or necessary. I confess that I have always so far offered it to my patients in such guise that it has invariably been refused, and on each occasion I have felt definite relief at the outcome. A reduction of sputum, which can generally be achieved by other measures, seems hardly a sufficient reward for this operation, and the really septic cases are hardly fit subjects for it. In combination with other surgical measures, however, rib resections may prove of decided value.

Ligature of the pulmonary artery or its branches does not seem to be a very difficult operation apart from the presence of adhesions. Its effect is to cause a fibrosis and shrinkage of the lung or lobe, and this so marked that in some cases a subsequent rib resection has seemed advisable. It has also been done as a preliminary to lobectomy. It was performed by Sauerbruch in 14 cases of bronchiectasis with no favourable results, and with no obliteration of the cavities. This seems to me the logical outcome, since pulmonary fibrosis itself leads to bronchial dilatation. There seems no place for this operation by itself in the treatment of bronchiectasis.

Lobectomy and Cautery Lobectomy.—Extirpation of the diseased area makes a natural appeal to the surgical mind, and it was inevitable that attempts at this should be made in selected cases of bronchiectasis. Unfortunately, the mortality for lobectomy, 52 per cent. among the 48 reported cases, has proved too high to encourage its further use. Most of the deaths were due to infection of the raw surfaces exposed during the separation of the practically always adherent diseased lobe or lung. To avoid this risk, Evarts Graham, whose name is well known to us in connexion with diseases of the gall-bladder, has since 1923 been urging the piece-meal removal of the bronchiectatic areas by means of the actual cautery. This is no new operation—Sauerbruch, in 1920, records having performed it in nine case, in five with decided and two with slight benefit, and with two deaths. Graham's claim for it is the establishment of numerous bronchial fistulas for massive drainage, by opening the lung tissue over a wide surface; the compression of the diseased area by packing and bandaging; and eventually the removal of more and more lung up to extirpation of the bronchiectatic lobe. This method, he claims, "combines the three cardinal principles of the surgical treatment of chronic pulmonary suppuration—namely, drainage, compression, and extirpation." The ribs are resected over an area about 4 inches square, the parietal pleura is exposed by stripping off the periosteum with the muscles, vessels and nerves, the pleural surfaces are examined to see if they are adherent, and if not steps are taken to make them so. This is the first stage of the operation. A few days later cauterisation is begun with a large soldering-iron heated to redness; a wide cross section is destroyed, so that when the slough separates some 20 or 30 bronchial fistulas are seen exuding pus; no anæsthetic may be needed at this and subsequent stages. Drainage is assisted by the use of suction apparatus. After about three weeks a second cauterisation is made, and this is repeated at intervals till the diseased area is virtually destroyed, from one to seven or eight cauterisations being needed in different cases. Hæmorrhage is controlled by packing which Graham has found to suffice even when large branches of the pulmonary artery are opened. No shock follows these operations, but fever and malaise often appear on the third day and persist till the slough separates on the tenth to twelfth day. Eventually the bronchial fistulas heal, or if open are found to supply about the same secretion as will a normal nose.

The obvious dangers of this operation are *air embolism* and *hæmorrhage*. Air embolism is indeed a danger in all operations for bronchiectasis owing to the inability of cut veins to collapse in the thickened tissues. Sauerbruch has recommended differential pressure apparatus for its avoidance. No less than three of the four deaths among Graham's first 20 reported cases were from cerebral complications, and two of these were almost certainly air embolism. Among his latest figures cerebral embolism was responsible for four among seven deaths in 31 cases. Graham curiously enough had no serious cases of hæmorrhage, and none of post-operative hæmorrhage. On the other hand, Hedblom, among only four cases, experienced severe hæmorrhage in three, and two of these died of it, one on the seventh day during the changing of a packing. Graham remarks that hæmorrhage should be easy to control, since the pressure in the pulmonary artery is only 15–20 mm. Hg. If it proves severe he stops the operation, packs, and removes the pack on the third day, repacking if necessary.

Among the 31 cases operated on by Graham up to 1925 55 per cent. were reported well (36 per cent. still with open fistula), 13 per cent. markedly improved, 6·5 per cent. were recent cases and the results unknown, 22 per cent. (seven cases) were dead. On looking through the case-notes one is struck with the fact that the majority were cases of lung abscess and but few of simple chronic bronchiectasis. The method seems applicable for any localised area of suppuration within easy reach of the surface, but less so, it seems to me, in the ordinary basal bronchiectasis. When one considers how these elongated cavities abut on

the diaphragmatic surface it is difficult to see how the cautery can destroy them without considerable danger of wounding neighbouring structures, such as the diaphragm or the pericardium. It will be interesting to hear what our surgeons have to tell us about the technical possibilities of this operation in bronchiectasis.

Summary.

Our present position, then, with regard to the treatment of bronchiectasis may, in my opinion, be stated as follows:—

1. It is best, as a rule, to be satisfied with a moderate result—that is, with relief of dangerous symptoms such as can be accomplished in most cases by well-applied postural drainage and creosote chamber, assisted by drugs, and reinforced, if necessary, by bronchoscopic treatment. This applies especially to bilateral cases.

2. If these measures fail, something further may have to be tried, and its success will depend on the suitability of the method to the type of case. Thus (*a*) pneumotomy is suitable for single large suppurating cavities and for little else. (*b*) Phrenic exairesis may partly eliminate, and assist drainage in, a strictly basal lesion and is indicated for such. (*c*) Pneumothorax and thoracoplasty should be reserved for unilateral cases in which the lung and the cavities seem likely to be collapsible. (*d*) Lobectomy and cautery lobectomy can only be considered for well-localised areas of disease. The latter operation, however, seems materially to enlarge the scope of the older pneumotomy, and to offer external drainage at least to a much greater number of cases. Finally, it may be noted that under some conditions a combination of two or more methods may best meet individual needs.

Anticipatory Treatment.

Before concluding my paper I should like to say a few words on prevention, or what I shall call here "anticipatory treatment," because it is very germane to our subject, and recent work is bringing one aspect of it into prominence. I shall not here speak of means for avoiding the exacerbations so common in bronchiectasis in its earlier stages, but confine myself to one point—namely, the dangers of bronchial aspiration. First, there are the cases, all too common, of bronchial suppuration, and later bronchiectasis, caused by aspiration of broken teeth, cotton-wool plugs, and the like, especially after tonsillectomies and tooth extractions. Secondly, there are the cases where bronchiectasis or "damaged lung" is already present, and where a severe or fatal lung suppuration follows operation, rightly considered necessary, for chronic infection in the throat, nose, or nasal sinuses. Such a result is due to aspiration of septic material during anæsthesia, and the same may happen also from septic mouth secretions or vomit during operations in other areas. Now recent work has shown how easily aspiration of mouth secretions occurs under general anæsthesia, and how frequently post-operative lung conditions are due to this cause. Where there is a bronchiectatic or damaged lung such aspiration is, of course, especially dangerous. Hölscher showed by the use of gentian violet that the râles developing during ether anæsthesia were due to aspiration of the mouth secretion, and not to bronchial irritation and secretion caused by the gas. Myerson, examining patients after tonsillectomy under light anæsthesia with a bronchoscope, found that 90 per cent. of cases where the cough reflex was lost had aspirated mucus into the tracheo-bronchial tract. Lemon, of Rochester, working with a barium mixture coloured by gentian violet, found, in dogs, that if the head was raised bronchial aspiration occurred whether anæsthesia was light or deep, and that the suction pump failed to prevent it. Where the horizontal position was used aspiration was less, and diminished steadily as the Trendelenburg position was approached. Similar aspiration must probably take place, also, where the protective mechanism breaks down under severe illness, delirium, or alcoholic intoxication, and especially where vomiting occurs. The means of avoidance lie, of course, in posture, in the maintenance of a head downwards position under all these circumstances until the cough reflex is again fully established, and I think we who see these chest conditions should broadcast this danger to all those who may be responsible for these happenings. Should bronchial suppuration follow the aspiration of septic material under an anæsthetic it is stated by Willy Meyer, of New York, that bronchoscopic aspiration at an early stage, combined if necessary with lavage, will bring such cases to cure, even where abscess formation has occurred.

At the conclusion of this paper I should like to record my admiration of the work being accomplished in chest surgery, and especially in the treatment of pulmonary suppuration, at the present time in America. Team-work and coöperation are the basis of this work; an enlightened coöperation of the physician, surgeon, radiographer, and bronchoscopist, for in America, as I have already remarked, bronchoscopy has become a specialty all to itself. They hold over there, and I think they are right, that such team-work is a more rational proposition, and will give superior results, than the "physician-surgeon" idea which is evolving in the Scandinavian countries, and in one centre at least in Germany. Where we cannot here even boast of a section devoted to chest disease as a whole, they have an "Association for Thoracic Surgery" with membership of 100, and an annual meeting whose transactions are always full of interesting and enlightening material. Pulmonary tuberculosis is not excluded from their programme, and here again I think they are right. Now that the interests of tuberculosis as a whole are being well-attended to, it is fitting that its problems as a chest disease should receive special consideration at the hands of chest physicians and surgeons. A society, or at least a yearly congress for the study of chest disease as a whole, embracing physicians, surgeons, laryngologists radiologists, and anæsthetists, seems to me greatly needed in this country, and only thus, in my opinion, will any real progress in this branch of disease be brought about in the future.

II.—BRONCHIECTASIS FROM THE SURGICAL ASPECT.

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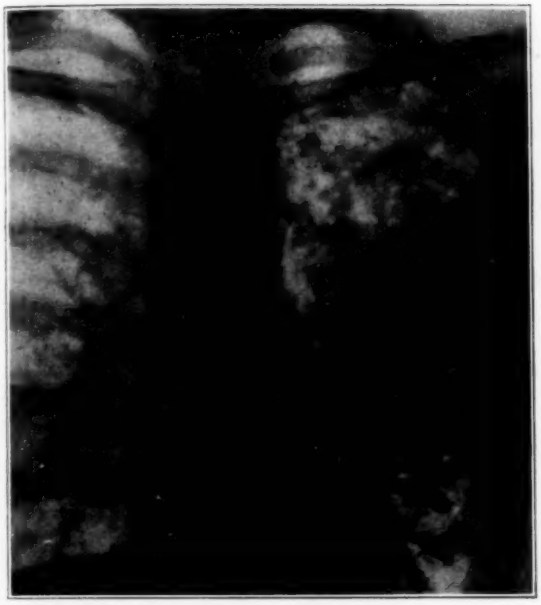
THE surgery of pulmonary infections, more especially of bronchiectasis, is still in the stage in which abdominal surgery was 30 or 40 years ago. By that I mean that the surgeon does not as a general rule see such cases until the condition has been in existence for a considerable time. Until the larger, as well as the smaller, bronchi are affected, their walls dilated, made rigid by fibrous tissue, and anchored by more fibrous tissue existing in the tissues outside them. Until the patient is enfeebled by long-continued toxæmia, loss of sleep from constant coughing, recurrent hæmorrhage, and in some cases by amyloid disease. Under such conditions it is matter for surprise, not that surgery does not produce better results, but that it produces results as good as it does. I hope that one result of such discussion as this will be a closer working together of the physician and surgeon at a much earlier stage than is as yet common.

Diagnosis.

The diagnosis is the field of the physician. It is in many cases difficult, especially in the upper lobe and in the earlier stages. The physical signs may be those of chronic bronchitis, or of pulmonary tuberculosis. In cases of bronchial obstruction by new growth or foreign body, the diagnosis is often not made until a late stage. It was said to me only a few years ago by a leading physician that it was

FIG. I.

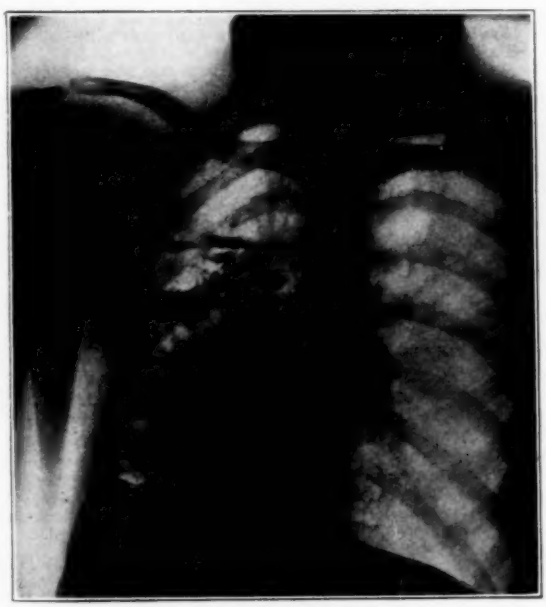


Lipiodol radiogram demonstrating dilatation of bronchi of lower lobe. No lipiodol enters the alveoli through the dilated bronchi. Patient recumbent.

FIG. II.

Lipiodol radiogram demonstrating sacculation of bronchi in lower lobe. Patient recumbent.

FIG. III.



Lipiodol radiogram demonstrating multiple sacculation in whole right lung. Fluid levels well shown. Patient erect.

FIG. IV.

Lipiodol radiogram from same case as Fig. III. 8 days later, showing some dilatation and sacculation of bronchi of left lower lobe. Some lipiodol is retained in the cavities of right lung. Patient recumbent.

MR. J. E. H. ROBERTS: BRONCHIECTASIS FROM THE SURGICAL ASPECT.

not possible to diagnose bronchiectasis until the physical signs of a cavity were present. To-day there are two methods which give great aid in the exact diagnosis. The older is direct bronchoscopy by which, first, bronchial obstructions may be actually seen and in some cases removed, and secondly, the bronchi from which pus is coming can be determined with accuracy. When our bronchoscopists are supplied with sufficient material for constant practice they will be able to emulate our American colleagues and dispense with general anæsthesia, for in my experience the American patient is not more phlegmatic and insensitive than the British one. The more recent advance is the introduction of some substance opaque to X rays into the air passages. This has the advantage that the condition of the bronchi which are beyond the reach of the bronchoscope is rendered visible in a radiogram and the extent of the disease is determinable.

In this country lipiodol, a combination of iodine with a vegetable oil and containing 40 per cent. by weight of iodine, is the substance most frequently used. Iodism does not occur unless the oil is coughed up and swallowed as the iodine is in chemical combination and can only be set free by a process of digestion. Lipiodol is non-irritating and produces no sensation as it passes into the trachea and bronchi. There are three methods of introducing it.

Technique of Lipiodol Radiography.

1. It may be introduced through a bronchoscope by means of a syringe with a very long nozzle.

2. After anæsthetising the larynx by a spray of cocaine, a narrow rubber tube with a metal end is lowered into the trachea. The metal end is visible on the fluoroscopic screen and by altering the position of the patient can be coaxed into either of the lower bronchi. The lipiodol is then injected by means of a syringe.

3. The method I prefer is to puncture the cricothyroid membrane by a needle and inject directly into the trachea. The technique is as follows. With a hypodermic syringe filled with 1 per cent. novocaine a cutaneous wheal is made. The syringe is then filled with a 5 per cent. cocaine, the cricothyroid membrane punctured, and about 10 ℥ injected. This renders the larynx less sensitive so that drops of fluid do not provoke a spasm of coughing. A special syringe which I have devised is now filled with 20 c.cm. of lipiodol. In order that the viscosity of the oil may be reduced to the point at which it will flow readily through the needle, both the oil and the syringe should be heated. With the patient recumbent and tilted slightly to the side which is to be examined, the cricothyroid membrane is again punctured with the needle, which is 2 cm. long and, therefore, does not reach the posterior wall of the larynx. The oil is injected slowly. For an adult 20 c.cm. is a usual amount to inject. If the upper lobe is to be investigated the head and shoulders are lowered for a minute or two. The patient should take a few deep breaths as the fluid is then aspirated into the smaller bronchioles and alveoli. Lipiodol is coughed out of the bronchi if there is no obstruction within 24 hours, but if it reaches the alveoli it appears to remain for a very long time, in one of my cases for 18 months, but it apparently produces no ill-effects.

The patient should be radiographed both in the erect and recumbent position, as sometimes what appear to be single large cavities are shown by fluid levels to be composed of several smaller ones. In order to avoid iodism in a susceptible person, the patient should be instructed not to swallow any oil which may be coughed up. The needle should be sharp in order to avoid pushing the mucous membrane inward and so injecting the lipiodol between it and the thyroid cartilage. I have seen this happen, but no ill-consequences followed. By withdrawing the piston slightly air is drawn into the syringe if the point of the needle is in the lumen of the trachea.

Fig. I. is a radiogram of the chest of a girl who was bringing up much stinking sputum. An able physician was unable to detect by physical signs which was the affected lung, or even that she had bronchiectasis. An ordinary radiogram gave no help. After injection of lipiodol it was clearly demonstrated that the bronchi of the lower lobe on the left side were dilated and that the rest of the lung was normal. Fig. III. shows a different type of case in which the right lung is occupied by numerous cavities. The radiogram was taken in the erect posture and the horizontal lines show the fluid levels. The condition of the left lung is shown in Fig. IV., this time taken lying down. The second film was taken eight days after the first and the presence of lipiodol in many of the cavities in the right lung after this interval shows that drainage is not free.

Treatment.

Except in children the medical treatment of bronchiectasis is in most cases merely palliative. While under active treatment life is rendered tolerable, the amount of sputum is greatly reduced, and its fœtor is diminished. But as soon as this active treatment is intermitted too many cases quickly relapse. In the case of a working man or woman it is certain that no continuous employment is possible. There is always the risk of a cerebral abscess. Jex-Blake [1] showed that in 108 fatal cases death was due to cerebral abscess in 15. He also stated that of 30 cases due to pleurisy and pneumonia the average duration was 39 months and the maximum 144 months. Of 40 cases due to bronchitis the average duration was 110 months and the maximum 600 months. The expectation of life then is not of a high order, and in the cases with much infection that life is not a happy one. It is considerations of this kind which render surgical procedures of some severity justifiable. I should say now that before any surgical measures are taken a proper course of medical treatment should be undertaken to get the patient into the best possible condition.

External Drainage Operations.—These are only of value where one or a few bronchiectatic cavities are present. A permanent fistula results. But it must be remembered that one ounce of pus from a cavity will sometimes collect 19 more ounces on its way through the bronchi. If the one ounce is drained away externally the rest is not formed. I have seen this result follow such an operation. But the number of cases suitable for external drainage are few.

Collapsing Operation: Artificial Pneumothorax.—Collapse of the lung by this method is of great value in the early case. I feel that it should be used as a routine in cases where pneumonia is followed by fibrosis whenever the absence of pleural adhesions allows it. Fibrous tissue only contracts when it is young and after a sufficient time has been allowed for it to become adult the lung may be allowed to expand. If sputum returns the collapse should be made permanent by a thoracoplasty. In cases of old standing artificial pneumothorax is still sometimes possible. If a complete collapse is obtained and the patient is not benefited then the lesser collapse obtained by thoracoplasty is contra-indicated. If, on the other hand, the sputum disappears or is very much reduced, then a good case is made out for making the collapse permanent by rib resections.

Phrenic Exeresis.—This little operation, which is performed in a few minutes under a local anæsthesia, is sometimes usefully done as a preliminary to other measures. In itself it rarely suffices. In one case, however, in which I did it the sputum was reduced from two pints to from three to four ounces. This result was not permanent. The condition of the patient was improved, he put on 2 st. in weight, and was obviously a better surgical risk for further procedures.

Thoracoplasty.—The best results are obtained by rib resections when one lobe alone is affected. The removal of ribs must be much freer than in cases of pulmonary tuberculosis. Except in the earlier cases paravertebral resection is not enough and should be supplemented by an anterior resection as in Wilms's operation or even by complete decostalisation in several stages. There are two classes of case in which a good result may be anticipated. First, those in which preliminary artificial pneumothorax has produced a total absence of sputum or has so diminished its amount and altered its character that life is

[1] Brit. Med. Jour., May 1st, 1920.

rendered tolerable, and secondly, where there has been such a degree of contraction that the diaphragm is pulled up, the mediastinum is pulled right over, and the ribs are in the expiratory position. Such a lung has done its best to close its own cavities and if permitted, by mobilisation of the chest wall, will contract still further. The objection that the largest bronchi still remain patent is not of real weight as the drainage from them is free so that, although some mucoid secretion still has to be coughed up, infection is controlled and the fœtid sputum disappears. Instances of the value of this operation are the following.

CASE 1.—A woman of 40, who developed bronchiectasis of the lower lobe following pneumonia. Her sputum was fœtid and amounted to 3 oz. a day. While under observation for three months the physical signs extended to the upper lobe and the sputum increased. A Wilms's rib mobilisation was done and the sputum disappeared. She has been free from sputum for nearly four years and earns her living as a milliner.

CASE 2.—An officer of the Indian police, who received a wound of the lower lobe of the right lung during the war; bronchiectasis followed. I saw him seven years later when he was on the point of being invalided out of the service. At that time he was bringing up 7 oz. of stinking sputum each day. A complete pneumothorax was obtained and his sputum was at once reduced to a drachm of sweet mucus in 24 hours. The collapse was made permanent by a paravertebral thoracoplasty done in two stages, and he returned to duty and has since been promoted. He has had no sputum for three years. He was stationed at an elevation of 5000 feet and writes that he can walk 15 miles and can play three or four sets of tennis.

CASE 3 (Fig. II.).—A girl of 20, who, at the age of 4, had pneumonia. When seen she was producing two pints of the foulest sputum daily. Under medical treatment her sputum diminished to 10 oz., but remained foul. She still had severe headaches and a very furred tongue and was unable to enjoy her food properly. After a paravertebral resection her sputum diminished to 2 oz. a day and became sweet. She lost her headaches at once and her tongue became clean. The operation was only done three months ago and she may possibly improve further. As it is she is content as she now feels well and is able to live a normal life. It would have been better to have done a more complete resection, but at present she does not wish it.

As an instance of the type of case where such a limited resection is unsatisfactory I will quote the following.

CASE 4.—A man with bronchiectasis of long standing on whom I performed a phrenicotomy followed by paravertebral thoracoplasty. No benefit followed, the amount and character of the sputum being unaltered. In this case no collapse was obtained owing to the rigidity of the chest wall. A complete decostalisation might have had a better result.

I believe from my experience that the operation is attended by more risk in bronchiectasis than in pulmonary tuberculosis, at any rate in the advanced cases. Deaths from pulmonary embolus and thrombosis are certainly more frequent.

Lobectomy.—The extirpation of a grossly infected lobe must always be a hazardous operation. It is only justifiable in cases where a preliminary collapsing operation has been unsuccessful and where the patient's life is intolerable. The modern method of, where possible, bringing the lobe outside the chest wall and fixing it there, removing it two or three weeks later, appears to offer a safer method of extirpation than the older one of amputating within the uncollapsed chest. This operation has been done in France and Dr. Harrington, of the Mayo Clinic, tells me he has done it three times in America without a death. My colleague, Mr. Tudor Edwards, has also, I believe, had a successful case.

Cautery Lobectomy.—This operation, devised by Evarts Graham, is not really a lobectomy so much as a very complete drainage operation. He makes a cross section of the bronchial tree with the actual cautery and has had fair success. In his hands, however, there have been deaths from hæmorrhage and air embolism and in the hands of others the deaths from bleeding have been more numerous still. Those surgeons in America and Canada who have tried it are not satisfied that it is safer than lobectomy. In bilateral cases the surgeon can do little, but as unilateral cases form over 50 per cent. of the total there is hope for the future in the close coöperation of the physician and surgeon working together. Prophylactic treatment by artificial pneumothorax may reduce the number of cases suitable for the surgeon, but where the condition is already established I would urge that collapsing operations should be done in the early stages, when a limited resection of ribs is more likely to produce a real cure. Even where the operation is only palliative it will in the earlier cases enable the sufferer to earn his living without constant resort to courses of medical treatment followed by as constant relapses.

SIGHT-TESTING OPTICIANS AND EYE DISEASE.

BY G. P. HAWKER, B.C., M.D. CAMB.,
SURGEON TO WEST OF ENGLAND EYE INFIRMARY; OPHTHALMIC SURGEON TO WEST OF ENGLAND BLIND INSTITUTION, ETC.

AT the present time when, under the scheme of ophthalmic benefits, expert advice is available to most people who are not eligible for hospital treatment or cannot afford to see an oculist privately, it is interesting to note how frequently one comes across serious eye and general disease in patients, who have been fitted with glasses and sent away presumably without the disease being recognised. The cases cited are all from private patients—i.e., those who are in a position to pay the usual fees, and do not include any who were eligible for hospital treatment or seen there. Only one of the patients was referred for further advice and that only after a long interval, and it is therefore inferred that the conditions were not discovered. None of them had been to the jeweller-seller of spectacles, who supplies spectacles which the person chooses for himself out of the box. In two cases definite treatment had been tried, one of which was the attempted removal of a foreign body under drops for the relief of pain.

Clinical Illustrations.

CASE 1.—Woman of 30. Something in right eye three weeks ago in train. To optician in about ten days, some black shiny stuff having come out two to three days before. Some drops put in to ease pain and given some lotion to use. Went again next day and then eight days later. Been typing all time but much watering and pain like toothache. Vision: Right = 6/12 (2); left, 6/12; corrected, 6/6 and 6/5. I removed a small foreign body like a yellow husk. Some distortion from scarring was left, and both lenses showed at the periphery fluffy dots of the congenital type.

Wrong Spectacles.—CASE 2.—Woman of 52. Complains of pains back of head and giddiness. Wears cylinders of +3 spher. with 1 cyl. right eye and +2·5 spher. with 1 cyl. left. Vision: Right, 6/36, with +4·5 spher. = 6/6; left the same.

CASE 3.—Spectacles from optician. Has cylinders wrong axis. Both lenses marked vacuoles and fine dust opacities. Well-marked Fuch's colobomata.

CASE 4.—Wears bifocals from optician. Right +3 and +6; left +4·5 and +8. Vision: Right = 6/24, with −0·5 = 6/12 (2); near vision +2·25 = J4; left = less than 6/60, with +3 = 6/9 (4); near vision +7 = J1. Both lenses show considerable radial opacities.

Corneal Ulcer.—CASE 5.—Woman of 51. Worn spectacles from optician for one week. Complained of difficulty with near vision and slight cold in left eye for a week. Eye was red with sensation like grit and could not stand the light. Given two pairs of spectacles and lotion and a bottle of medicine and told to come back in a week. Left eye showed a marginal ulcer and was very injected.

Keratitis (old and recent).—CASE 6.—Woman of 27. Sight hazy some months and lids stick mornings. Spectacles for seven years; last pair 12 months ago from optician. Yesterday sudden diplopia and mistiness left eye; saw two lots of cars and two roads. Examination showed paresis

left ext. rectus and recent and old interstitial keratitis, recent only in left but old in both with tracks of vessels. History of old T.B. spine.

Absolute glaucoma; chronic, not quoted, as I am not certain of the type of optician, I think a jeweller.

Choroiditis.—CASE 8.—Man of 26. Worn spectacles six years as lithographer, first from eye infirmary, then opticians, and recently to one who could not make him see. Left eye misty six days. Vision: Right, 6/60 −4=6/4·5; left, less than 6/60 −3, with −0·75 cyl.=6/12. Right eye normal but for small crescent. Left, vitreous many fine dust opacities; below macula irregular patch of recent choroiditis of disc's size and below two other patches, one old and one fairly recent. Many dental abscesses.

CASE 9.—Man of 50. Scratched left eye with nail and shows subconjunctival ecchymosis. Recently spectacles from optician. Vision: Right, 6/18 and with +1·5=6/12. Has much perimacular choroiditis with much pigment, obviously not noticed by the optician, who did not tell him why his sight was so defective.

Cataract.—CASE 10.—Woman of 66. Worn spectacles a few months from optician, −2. Vision: Right, 1/60, and left=light only. Lids chronic blepharitis. Spectacles no use to her and should have had treatment for lids long ago.

CASE 11.—Woman of 73. Spectacles from optician a week ago. +0·75 spheres in rolled gold frames for which she was charged £2 2*s*. Vision: Right, 6/36, and with +1=6/24; left, 6/36 (1) and no improvement. Considerable posterior cortical opacities both, lids chronic blepharitis with scabs.

Diabetes.—CASE 12.—Man of 65. Spectacles three months ago from optician. Right, 6/18, with +1=6/9; left, 6/24, n.i. with spectacles. Indefinite fluffy opacities both lenses; arteries tortuous and minute small recent hæmorrhages both. Much thirst, drinks 3–4 quarts a day; referred to doctor, who found diabetes.

CASE 13.—Woman of 62. For three weeks pain above right eye with headache and nausea. After three days sight misty and things looked smoky. Daughter noticed sight of one eye—i.e., the pupil—larger than the other. Had spectacles from optician from time to time for 12 years. Examination showed right pupil dilated and fixed, lens like wet granulated sugar, and vision 6/60 n.i.; left eye 6/18, and lens showed ill-defined dots. Referred to own doctor who reported large amount of sugar.

Cyclitis.—CASE 14.—Woman of 48. Sight of left eye failing eight months, when she went to optician and was given spectacles. Bad mists getting worse. Vision: Left=fingers at 2 yards; pupil sluggish, vitreous many dust opacities, while fundus showed multiple discrete patches of choroiditis with some atrophy.

Vascular.—CASE 15.—Man of 68. Stroke five months ago, right side, partial, cleared up. Sight of right eye went suddenly July 27th; bumps into things on the right. Seen 30th, had spectacles yesterday from optician "to rest his eyes." Same morning pushed a 12-gallon milk-can about ¼ mile. Vision: Right, 6/24 (2), with +2=6/9. Fixation good. Fundi show arteries small and thread-like veins cut and full. Fields showed complete homonymous hemianopia. Here distinct danger to life was involved.

CASE 16.—Woman of 69. Recently spectacles from optician, who frightened her badly by telling her she had cataract but said nothing of the fundus. The lenses showed a few feathery peripheral streaks not affecting sight, which corrected was 6/6, but the fundi showed much Tay's choroiditis, the arteries were corkscrew and just above the left macula was an ill-defined white exudate.

CASE 17.—Woman of 77. Mists in front of eye three to four months, yellow zigzags two to three years. Last summer woke up suddenly and everything black for some hours but sight got all right though always misty. Some years ago bleeding from nose for a week. Spectacles from the opticians to a London hospital (whom, she said, ought to know all about the eyes) four to five months ago. Moderate cataract both, vitreous many coarse opacities. Vision: Right, 6/36, with head tilted back; left, 6/36, corrected 6/18. Right fundus showed senile macular changes with many old soft-edged white hæmorrhages, while the left showed a recent big hæmorrhage above the macula and many smaller of all stages.

In addition I have seen many cases, who have come to me in great distress, having been told they were suffering from cataract, of which many seemed to have great dread, only to find they had two or three streaks such as might cause no trouble for many years. Only three cases of wrong spectacles causing symptoms are quoted.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society held on Nov. 19th, with Dr. E. H. SNELL, the President, in the chair, Sir WALTER FLETCHER opened a discussion on

RESEARCH WORK IN PREVENTIVE MEDICINE,

from the point of view of the Medical Research Council. He referred to the work of the Council in promoting the health of the people and preventing disease, and in particular to the recent researches of Dr. Corry Mann on the diet of school-boys.[1] He said that the medical officer of health had a power of applying the fruits of research that was far greater in many respects than that of other members of the medical profession. He advocated very strongly the establishment of coöperation between the Medical Research Council and medical officers of health. The Council might be expected to promote to the utmost of its power the developments in all primary sciences in all fields which were likely to bring new weapons to the work of the medical officers. The real difficulty in getting effective application and development of research work in the field of medicine was the fact that experiments, in by far the greater number of cases, had to be done with animals, so that there must always be adaptations and adjustments. One of the difficulties of experiments on men was to arrange for proper controls. He referred to the remarkable results obtained by a certain Scottish medical officer of health in the application of the Dick test and the new preventive treatment of scarlet fever, which disease had been abolished in the nursing staffs of the hospitals in his district. So far as he knew this had not yet been tried in London; it was a benefit that had long been waiting for application. A similar "lag" was to be observed in the case of the prophylactic treatment of diphtheria by toxin-antitoxin.

Dr. W. G. SAVAGE spoke from the point of view of the M.O.H. He said that research work was the foundation of preventive medicine, the touchstone of its validity, and its only hope for the future. The medical officer of health stood as the official exponent of the application of preventive medicine.

The Field.

Far fewer mistakes would be made if facts were established on a firm basis by research before administrative measures were adopted as a general procedure for the country. Unfortunately, the validity of an attractive hypothesis could often only be tested by basing administrative action on it. The solution of this difficulty was to adopt the necessary action in sections of the country only, and to treat it as a research problem instead of booming it as an administrative acquisition. For example, the widespread installation of isolation hospitals had involved great expense to the neglect of other methods of controlling infectious diseases. Research would have demonstrated the unsoundness of the original hypothesis in the first place. If the research attitude to public health problems had been in continuous application, a wider and truer conception of the truth of many problems would have been reached much earlier. Simple goitre and acute rheumatism were problems of the moment, and the world was full of theories—many of them excellent hypotheses if regarded purely as bases for critical research. There was an immense sphere for laboratory research, but its inevitable complexity made it difficult for part-time workers. Research work in public health by no means meant laboratory work, although this was an excellent introduction and training for administrators and field workers. There was a vast deal of waste of

[1] THE LANCET, August 7th, p. 295.

research material, for instance, the piles of data elicited in connexion with school medical work and thrown into an ill-digested heap between the covers of an annual report. Rapid routine work and research deductions from the same material were almost incompatible, and chief and assistants had no time for the little bit more which would gain so much more. A sharp distinction should be drawn between data drawn from ordinary routine work and those drawn from work carried on under the especial supervision and attention implied in a research outlook. Eminent statisticians were inclined to pay too high a compliment to the value of ordinary routine figures, and were apt to base conclusions on them which clearly could not be true.

The Man and His Employers.

It was often assumed that anyone could do research work. Dr. Savage's opinion was that about 10 per cent. of average qualified men were capable of efficient research, and that investigators could not be made by training. He did not agree that every officer in the public health service should undertake research work. Rather should suitable individuals be selected, their facilities enlarged, and their efforts seconded. To find and to utilise workers in the field of preventive medicine was one of the paramount needs of public health.

Of the several factors which united to make the harvest so scanty the chief was the lack of time. Local authorities who appointed and controlled officers in the public health service had but the dimmest idea of the importance of research work, and with but rare exceptions contributed nothing to it but severe discouragement of any expenditure on equipment or additional personnel. Nor did central health and educational authorities give much help in the stimulation of local bodies. Moreover, there was a lack of willingness among the officers themselves to devote their leisure time to research, and great credit was due to those who persisted in the face of much passive discouragement.

Criticisms of the Present System.

Prof. W. W. C. TOPLEY said that the greatest triumphs of bacteriology had been in the field of preventive rather than of curative medicine, and that the medical officer of health was in a quite exceptionally favourable position for taking the wide biological view of problems.

If research was to play its proper part in the service it must be given reasonable help and encouragement, at present conspicuous by their absence. A broad distinction should be drawn between routine examinations and investigations leading to an advance in knowledge. If men of active and inquiring minds were to be attracted to the laboratory side of public health work they must not be condemned to too much routine work. A young post-graduate should feel that a laboratory post with facilities for research was one of the alternatives to look forward to if he entered the public health service. The R.A.M.C. had provided an instance of the benefits which accrued to a service from the presence of an able and original laboratory investigator. If the bacteriological laboratory were made an integral part of the public health service there would also be a considerable drift from the laboratory to the administrative side and back again, to the great good of the service as a whole. A man who had learned what a laboratory could and could not do was clearly at a great advantage when he came to investigate infective disease in the field. The present system, whereby most of the public health laboratory work was done in university departments, endowed institutions, or commercial laboratories, was unhealthy for all concerned. The work was well and economically done, and the institution gained financially, but so long as they undertook such work it must be a first charge on their energies, whereas the primary duty of universities and research institutes should be the training of students and the advancement of knowledge without regard to its immediate application. A man could not serve two masters. The research work of such institutions did not in any way arise out of the routine examinations, and must be developed along its own lines and not governed by the relative urgency of particular problems in applied bacteriology.

The Remedy.

The position which might well develop if local authorities took over their own bacteriological work would be worse than the present one. It was essential to see that each institute combined original research with routine investigation. For this the unit must be large. The small laboratory was very expensive and relatively inefficient. For example, the cost per test of the Wassermann reaction would be five times greater in a small laboratory than in a large one. Performance of a large number of tests daily was a valuable safeguard against faulty reagents or other sources of error. Moreover, in a large laboratory the staff could enjoy considerable elasticity of work, which would enable them to undertake research. This would be still better provided for if several laboratories could be so linked as to facilitate interchange of staff and the concentration of special departments of work in different institutions. The work of such laboratories must be confined rigidly to those examinations which were concerned with the ordinary routine of public health work, as distinguished from that usually called clinical pathology. The areas to be served by such laboratories could not be determined by the present administrative boundaries. The danger of cramping research work and producing a less efficient and more expensive service by some attempt on the part of local authorities to set up each their own little laboratory was real and urgent, and some society such as this should put forward a considered policy.

The Statistical Method used by the Amateur.

Dr. MAJOR GREENWOOD defined research as the bringing to light of the relation between phenomena or facts, which might either have been long known or first brought to light by the investigators; if the relations deduced led to some practical rule which might cause saving of life or reduction of pain or sorrow, then that research had value for the public health service. Very few medical statisticians had been in a position to modify facts. In the enormous catalogue of ascertained facts that we now had there were important relations to be deduced between certain of them which had never been noticed, but it was much harder to find them than it was before the eminent Victorian statisticians had done their work. The modern seeker, however, had the advantage that the field had been very much enlarged since then. Several countries now had medical statistics as good as our own, and if the medical officer had to ration his time between learning statistical methods and making himself familiar with the statistics of other countries, he should devote the greater part of his time to the latter. The speaker would not make algebra a compulsory subject for the D.P.H. but he would make the ability to read French and German fluently an absolute qualification. Facts should be taken first-hand and not from other men's books. He referred to the Medical Research Council's recent reports on Diet for School-boys and the Evolution of an Epidemic of Diphtheria in a Boarding-school, and pointed out how each depended on continuous observation of a closed community in which the changes in composition could be exactly known and studied. The value of boarding-schools for research had been underrated; no school had yet found its Gilbert White, ready to study what was happening all the time. Much light might be thrown on the evolution of respiratory epidemics, and on what happened before an outbreak of such diseases as scarlet fever and poliomyelitis. The disadvantage of mice as the subjects of experiment was that we could not speak their language and all cases were necessarily fatal.

The departmental committee of the Ministry of Health on cancer had recently set itself the question: How many people are radically operated on for cancer

of the breast and how much longer do they live than people who are not, and if the proportion is small, why is it small? This needed the coöperation of medical officers of health, and required that all sanitarians should think the problem out and consider how it might be studied. It was a striking feature of the work of the greatest living master of statistical method—Prof. Karl Pearson—that scarcely any of the efforts of the public services had been praised by him. Destruction must precede construction, but there was a danger of supposing that "Not proven" and "Not guilty" were identical verdicts, and of regarding the medical statistician as a superior person picking holes in other people's work.

Discussion.

Dr. J. T. C. NASH said that in his district of Norfolk there were very few isolation hospitals, and not 10 per cent. of the infectious cases were isolated. It was, however, very sparsely populated. There was a scheme of notification by school-teachers of all cases of absence due to infectious disease. Copies of these notifications were sent to district medical officers, and all agreed that much more information was gained thereby than by the more usual methods. The figures of the district compared very favourably with those of an adjoining area where there were eight hospitals and 80–90 per cent. of cases were isolated. Last year there had been 550 notifications of scarlet fever and no deaths. He was against small units; an isolation hospital was only of use if it were large, well staffed, and well looked after. He would add to the qualifications of the D.P.H. a good knowledge of logic.

Dr. ANDREW BALFOUR pointed out that it had been said that in no single case had the organism of a communicable disease been discovered by any medical officer of health in this country. This had not been to any great extent the fault of the officers, but he was concerned with any measures of improvement that might be effected by the new School of Hygiene and Tropical Medicine. It could not be expected to create research workers, but it might be able to find out who were the men who had received the divine touch and guide them and suggest to them fruitful lines of research. It must also educate the local authorities, which was no easy task. They must be shown graphically that it would pay them handsomely to allow their officers some time off to see what was going on. This might be done by the proposed great Museum of Hygiene; invitations might be sent to all laymen connected with public health to come up to demonstrations of how research had helped to combat disease. The School should also provide refresher courses in research work and a training in scientific French and German, and, if necessary, other languages. All medical research should tend towards the preventive idea.

Dr. A. B. MCMASTER asked what would be a suitable unit of size for an effective pathological laboratory. He pointed out that medical officers had done much research into communicable disease, but naturally their work had not gone, and should not go along the lines of laboratory research. He instanced the pioneer work of Niven on the spread of tuberculosis.

Dr. E. WARD said that the chief difficulty of research among private practitioners and the accessory public health services was that of finding people who could do research work. So many seemed to think that enthusiasm was the only quality necessary. Most of all should they beware of research by questionnaire, which seemed to substitute for the obiter dicta of great men the opinions of small men, and led to no great advance. It had been said that research was hampered for lack of advice, but the man who depended on his research for his initiative was not likely to achieve more than mediocrity.

Dr. W. JAMESON pleaded for clinical research, especially into the problem of small-pox and alastrim. It appeared that it was possible at the end of the third week of an epidemic to state definitely whether it was the kind of "small-pox" that was going to kill people or not. What was happening was that in the provinces large numbers of people were coming to regard small-pox as a trivial disease, less troublesome than vaccination while in London it had really been a horrible thing. The "country" type only killed those at the extremes of age or those suffering from some other disease. Of four deaths in Gloucester recorded as due to small-pox, one was an infant, another was a baby with severe diarrhœa, the third was a child with malignant measles and the fourth was an old gentleman.

Dr. R. MAULE HORNE brought forward the point of view of public opinion, which sometimes took a great deal of inducement to recognise research and was apt to ask "what the man meant by poisoning innocent children."

The PRESIDENT said he could not agree that research workers could not be made. It was quite possible for a comparatively ignorant worker to make a discovery he was not even looking for. A vast responsibility rested on the Medical Research Council to direct work in fruitful directions. Many medical officers of health were doing unorganised work.

Reply.

Sir WALTER FLETCHER, in reply, said that the value of research was rising, and would rise more in public opinion. The great difficulty now was the want of sympathy of lay authorities, a difficulty that seemed to be less if a woman was in charge. Medical officers of health could do more than anyone else to help in educating public opinion, and should seize every opportunity.

Dr. SAVAGE, in reply, agreed about the complete worthlessness of questionnaires and small laboratories, but still maintained that research workers were born, not made. An accidental discovery was not necessarily research.

Prof. TOPLEY, in reply, said that the effective laboratory unit would roughly be one that cost between £10,000 and £20,000 to build, between £5000 and £8000 a year to run, that tested 20,000 to 30,000 specimens a year, and served a population of 400,000 or 500,000.

Dr. GREENWOOD, in reply, said that statistical research was the only kind that the ordinary assistant medical officer of health had a chance of doing, and pleaded that their seniors should encourage them in it and advise them to seek the help of the Medical Research Council.

MEDICAL SOCIETY OF LONDON.

DIAGNOSIS AND TREATMENT OF BRONCHIECTASIS.

AT the Medical Society on Nov. 22nd, Sir HUMPHRY ROLLESTON presiding, a discussion took place on recent advances in the diagnosis and treatment of bronchiectasis. The openers were Dr. CLIVE RIVIERE and Mr. J. E. H. ROBERTS, whose papers appear at pp. 1102 and 1106 respectively.

Discussion.

Two foreign visitors, in response to the President's invitation, said a few words. Dr. ARMAND DELILLE suggested the possibility of limited bilateral rib resection as a procedure of some promise, and Dr. SCHRÖDER, who said that he had not seen very good results from thoracoplasty, favoured a more extensive rib resection than had been advocated by Mr. Roberts.

Dr. L. S. BURRELL emphasised the value of medical treatment, pointing out that if one could get the patient sufficiently early medical treatment would keep him alive and well without surgical interference for the rest of his life. Before starting any treatment whatever, the cause must be carefully looked for, and foreign body, aneurysm, syphilis, or neoplasm excluded. The two courses of treatment that he advocated were posture and some form of creosote therapy. With regard to the more serious forms of treatment, if the patient did not improve, and there was definite evidence of localised trouble, one should try either artificial pneumothorax or washing out the tubes through the bronchoscope. When a satisfactory collapse was obtained, treatment by artificial

pneumothorax was very successful, but the trouble tended to recur when the treatment was stopped. He had seen very good results from washing out with the bronchoscope, and in skilled hands this procedure was certainly not painful nor very inconvenient. With regard to surgical treatment, in his opinion thoracoplasty was not satisfactory in these cases. His own preference was for pneumectomy with the cautery—Graham's operation. Lobectomy with the knife was so dangerous that one could hardly conceive it being justifiable. But he held that no surgical treatment should be attempted until the possibilities of medical treatment had been fully explored.

Mr. TUDOR EDWARDS said that the value of lipiodol in the diagnosis of bronchiectasis was definitely established. It was specially valuable when the question of surgical treatment arose, because it was essential for success that the disease should be unilateral, or at any rate that the extension to the better side should be known and the amount roughly estimated. Artificial pneumothorax would not cure established cases of bronchiectasis, and in those cases in which it diminished the sputum temporarily thoracoplasty would make that improvement permanent. In early cases artificial pneumothorax might allow for sufficient contraction of the fibrous tissue to prevent the extension of the disease, but as soon as the lung was allowed to expand this process would extend. He had performed phrenic evulsion on patients with bronchiectasis 20 times, and in almost every case there had been some improvement, either in diminution of sputum or amelioration of symptoms. In one or two cases evulsion had led to cessation of severe hæmoptysis in bronchiectatic cases; unfortunately, in a proportion of cases the amelioration was not maintained. The results of thoracoplasty were somewhat variable. He had performed this operation on 11 patients with bronchiectasis. In four of these the results had been excellent, three had no sputum nor symptoms, the sputum in the other case had diminished from 10 oz. (offensive) to 1 oz. (non-odorous) per day. The other cases gave less satisfactory or definite results. He had performed Graham's operation of cautery pneumectomy in one case, but the result had not been satisfactory.

Dr. F. G. CHANDLER said that he did not know whether lipiodol would give a characteristic picture in the really early stages of the condition, but he was quite convinced that it would prove dilatation at a stage when the symptoms were only slight and the general condition good. The diagnosis having been made and the condition having proved unilateral, decision was by no means easy. To advise a major operation, which was attended with risk, and from which definite results could not be absolutely promised, was no light responsibility. Postural treatment, creosote chamber treatment, and prolonged climatic treatment all helped, but it was doubtful if they would cure. Vaccines, he believed, from a recent experience, were not without risk. He thought the best course was to do a pneumothorax, keeping the lung collapsed for one year and then allowing it to expand. This might prevent an extension of the disease, and there was some evidence available that it might cure, but time alone would show whether this was so or not.

Dr. LENNOX WAINWRIGHT mentioned that he had a case many years ago which looked like dying. He was advised to inject ichthyol (5 per cent. in glycerine). The patient coughed up very violently and gradually improved; he was now 82 years of age.

Sir PERCIVAL HARTLEY thought that bronchiectasis was altering a little in character; it was not so offensive as formerly, and in view of these better conditions and prognosis it was specially needful that care be taken before advising serious surgical operations. Preventive treatment was essential after whooping-cough and broncho-pneumonia. Phrenic evulsion was a harmless method which could be used in a good many cases. Artificial pneumothorax did not often lead to permanent improvement. A certain number of thoracoplasties did well.

Dr. GEOFFREY MARSHALL pointed out the importance not only of posture but of exercises, and described a system of exercises worked out in the massage department at Guy's.

Mr. ZACHARY COPE asked whether anyone believed that creosote had any killing effect on microbes in the lung; it seemed to him more a matter of faith than of creosote.

Sir JOHN BROADBENT thought that the cases which occurred after pneumonia, whooping-cough, and the like were much more likely to have infected cavities and to give rise to offensive sputum than those which followed simply from pressure on the bronchus.

Reply.

Dr. RIVIERE said that the impracticability of patients who had to do their ordinary work resorting daily to the creosote chamber had been pointed out, but this was not necessary; after a time they might leave the creosote chamber safely if they carried on drainage or use it only at quite longish intervals.

Mr. ROBERTS said he regarded extensive operations in these cases in the light of an amputation—a confession of failure. But his point was that where medical treatment had failed the surgeon should be asked to come in at a stage when a simple operation would offer the patient a chance to lead his ordinary life.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society held on Nov. 10th Dr. A. L. FLEMMING, the President, took the chair, and Mr. A. W. ADAMS read a paper on the

Treatment of Congenital Club-foot.

He spoke particularly of congenital talipes equinovarus as being the commonest variety. The ætiology was unknown, he said, but he inclined to the old theory put forward by Hippocrates and by Galen, that deficiency of the liquor amnii allowed pressure on the fœtus. The theory of arrest of development could not account, he thought, for some of the varieties. The incidence was greater among males and it was said to show a familial tendency, but this was found in two cases only of his own series, the patients being brothers. There was a tendency to associated deformities, and the condition often affected both feet; in Mr. Adams's series both feet were affected in half the cases. Discussing the usual deformity, he pointed out that two factors must be recognised—rotation inwards on an antero-posterior axis brought the os calcis up under the internal malleolus; rotation inwards on a vertical axis at the midtarsal joint brought the fore part of the foot pointing inwards, and the sole backwards. The tendons and ligaments on the inner side of the ankle-joint were shortened.

For a successful cure, said Mr. Adams, two things were essential: (1) early treatment, beginning at the age of one month if possible, when the tissues were pliable and the bones relatively plastic; and (2) regular, prolonged, and continuous treatment. It was a waste of time to attempt treatment on manipulative lines unless the parents realised that for success they must coöperate with the surgeon. For several weeks treatment aimed at reposition; for some months at retention; and for some years at education. The first step was to secure the reposition of the astragalus; this was brought about by manipulation around the antero-posterior axis. The astragalus was forced in under the tibia, and the os calcis was drawn downwards and outwards under the astragalus. In addition to forced movements by the surgeon the foot was moved as far as possible into the correct position several times a day by the nurse, being held there for a few minutes. When the posterior part of the foot was rotated, the anterior part was turned outwards on a vertical axis. Slight over-correction was the aim. In all cases some fibres

of the deltoid ligament had to be divided, in many cases part of the inferior calcaneo-scaphoid ligament must be severed, and in a few tenotomy was needed. As soon as the foot could be brought well out it was put up in plaster for several weeks, with changes and manipulation once a fortnight. The tendency for the plaster to fall off a fat leg and foot was met by carrying it up over the knee, or by incorporating strapping. The next step consisted in tenotomy of the tendo Achillis, without which attempts to correct equinus would stretch the plantar ligaments. The over-correction should not be too great. A wooden sole-plate was used with strapping to retain the foot in the over-corrected position. Movements and massage were continued at regular intervals, and this was the difficult time, for parents saw the foot in a good position and wished to discontinue attendances that had become wearisome. At 18 months a malleable splint down the back of the leg and along the sole was employed, fitted with a toe-plate to resist the tendency to varus. The child was encouraged to walk, but wore the splints day and night; a small overshoe was used with the splint. The régime of massage and movements was continued long after the splint could be discarded, and by the age of 3 the child could learn simple exercises and so coöperate in treatment. In some cases, however, iron supports were needed for several years, and in others—those which came late for treatment—cuneiform osteotomy was required. The only absolute bar to cure was failure to attend the surgeon regularly for the necessary period of several years. This might be interrupted by a variety of causes—illness in the family, a new baby, poverty, or, most exasperating of all, stupidity or carelessness of parents—any of these might vitiate the results of months of work. Long treatment in plaster seemed to interfere somewhat with the nutrition of the limb. Neither this nor some degree of flat-foot, which was not uncommon, appeared to cause the patients any trouble. There was a tendency to hallux varus when the child began to walk without splints, and in some cases an inward twisting of the tibia; osteotomy of the tibia might be needed, but had not been employed in any of the cases shown. In conclusion, Mr. Adams described the results obtained with 33 feet, to show how regularly results less than "good" were associated with sporadic attendance. Eight cases were shown to illustrate the later stages of treatment, and many photographs to demonstrate the application of various forms of retention apparatus.

Prof. E. HEY GROVES agreed that the greatest difficulty in treatment was to secure the efficient coöperation of parents. He thought that sufficient emphasis had not been given to the correction of the malposition of the astragalus; he had found that reposition in a small flat-foot was not easy, but thought that failures were often due to this part of the deformity not having been corrected. He advised osteotomy of the tibia where the foot looked inwards. Tarsectomy gave excellent immediate results as regards reposition, but the after-treatment needed to be just as careful and prolonged, and the final result was not so good, as with manipulative methods. He particularly admired the sole-piece used by Mr. Adams.

Mr. H. E. CHITTY agreed that the displacement of the os calcis was the most difficult part of the deformity to reduce. He found plaster splints very difficult to retain in position, and used a small internal malleable splint. In late cases he took out a wedge on the outer side to correct the heel, and found the remaining correction easy.

Mr. E. WATSON-WILLIAMS noticed that the first case shown, and several of the photographs, had the second or third toe pushed up out of line so as to lie on the dorsum of their neighbours. He asked whether this disappeared of itself later, what was required to correct it if not, and whether it was connected with the tendency to hallux adductus.

Mr. W. A. JACKMAN said that he regularly used Mr. Adams's splints. He had had very good results in seven cases out of eight with splints, not using plaster. All his patients had bilateral deformity.

The PRESIDENT asked whether the almoner's department had been used to follow up the cases and added that the wealthy failed to get the best treatment, as well as the very poor, for they were inclined to go from one surgeon to another, and thus lost the benefit of continuous treatment by one method. This type of deformity, he believed, was related to defective heredity, which was relatively common in remote and isolated districts.

Mr. ADAMS, in reply, said that he recognised that the posterior deformity was the most difficult to treat. The correction could be made at the same time as the abduction, and it was not difficult to overdo it. As to the advantage of plaster over splints at the early stage, he thought that splints needed daily attendance. The following of cases, he agreed, would be easier if there were an officer specially detailed for this service, and great efforts were often needed to keep some parents attending regularly.

Mr. E. R. CHAMBERS showed a case of carcinoma of the uveal tract in a woman of 55 of four months' duration. An exactly similar growth had been removed from the same site five years ago. He proposed to treat the condition with radium.

Dr. A. D. FRASER showed eight specimens of endometrioma, and briefly described them.

JAMES MACKENZIE INSTITUTE FOR CLINICAL RESEARCH.

ON Oct. 26th Prof. SHAW DUNN read a paper on

Disturbance of Renal Function in Experimental Nephritis.

Referring to the object and scope of his research into experimental nephritis in animals, he pointed out the difference between the acute form as seen in the rabbit and in the human subject, and showed the essential lesion in the former to be in the first convoluted tubule, and not in the glomerulus. He made the interesting observation in this connexion, however, that albuminuria did occur, and hence it might be presumed that some functional change took place in the glomerulus also. Describing the results of inducing nephritis in rabbits by giving sufficient doses of oxalates, he showed that there was a diminution in urinary nitrogen excretion and an increase in the blood-urea, sometimes to high levels. There was also, he stated, acidosis, and it was probable that an additional function of the renal tubule was the maintenance of the body's alkaline reserve. The diminution in the percentage of urea excreted and the rise in blood-urea showed a diminished power of concentration by the kidney. By the injection of saline, however, an artificial polyuria might be produced which washed out the urea in large quantities and brought down the level of the blood-urea. Prof. Dunn put forward the view that the retention of urea might be explained by the hitherto impermeable tubule cells being killed or damaged, and hence becoming permeable and permitting the reabsorption of urea. So, also, anuria might develop. The few experiments which had been possible on chronic tubular lesions confirmed the main conclusions and showed the importance of an adequate supply of water to secure a sufficient excretion of urea, and the danger of reducing this supply in cases in which the concentrating power of the kidney was permanently lowered.

On Nov. 3rd Dr. BARCLAY NESS read a paper on Difficulties in the Clinical Diagnosis and Prognosis in the various forms of Chronic Bright's Disease.

THE "PENNY IN THE POUND" AT RUGBY.—The board of management of the St. Cross Hospital, Rugby, is instituting a "penny in the pound" scheme to replace the existing "flat rate" which limited the number of cases admitted in proportion to the amount paid by each firm.

Reviews and Notices of Books.

THE HEART.

By ALEXANDER GEORGE GIBSON, D.M., F.R.C.P. Lond., Physician to the Radcliffe Infirmary. London: Humphrey Milford. Oxford Medical Handbooks. 1926. Pp. 108. 5s.

A BRIEF exposition of cardiology may be technical or it may be popular, but it can hardly be both. To compress even the most fundamental facts and theories of cardiology into 100 small pages is an impossible task, but it is surprising how much information this little book does contain.

A first chapter on general principles is followed by an admirable short account of the aims and methods of clinical examination, in which the author deals briefly with the recognition and significance of over-action of the heart, valvular lesions, cardiac enlargement, variations in rhythm, ætiology, and efficiency tests. Another useful chapter on the recognition of the normal heart and one on instrumental methods are followed by 30 pages devoted to diseases and disorders of the heart. This section is extremely condensed and the drawings illustrating the various lesions are not worthy of the space devoted to them. The two final chapters deal with the principles of prognosis and treatment, and are followed by a good bibliography. The views expressed by the author are for the most part in accordance with modern teaching. There are, however, certain statements with which many cardiologists will disagree. For example (p. 37), that the diastolic pressure corresponds to the loudest sounds; (p. 57) that subacute bacterial endocarditis is invariably fatal; (p. 70) that complete heart-block gives rise to the Stokes-Adams's syndrome; and (p. 95) that digitalis should not be given to patients with heart-block. Some of these views are perhaps open to differences of opinion; but the statements on p. 6, which imply that cyanosis is due to an increased tension of carbon dioxide in the blood, and that the condition of oxygen-want is seldom seen at the bedside, do not accord with facts now well established.

We doubt whether Dr. Gibson is right in believing that the subject of cardiovascular disease has yet attained a sufficient degree of exactness and finality to enable it to be treated on simple lines, but, at any rate, his book can justly claim to give a bird's-eye view of the present-day conception of the subject.

AGRAPHIA.

Über die Agraphie und ihre lokaldiagnostischen Beziehungen. By Dr. GEORG HERRMANN and Prof. Dr. OTTO PÖTZL. Berlin: S. Karger. 1926. With 29 illustrations. Pp. 380. M.24.

THE study of aphasia is in danger of becoming more than ever complicated by reason of the number and size of the contributions which it appears to invite. When a volume of nearly 400 pages is devoted to agraphia alone the wonder arises that its authors should not be content with supplying in more concise form the results of their researches; life is short, but the subject of aphasia seems unconscionably long.

The authors rely mainly on their case of tumour of the right parieto-occipital region in an ambidexter. Agraphia was the prominent symptom throughout, but some alexia, left homonymous hemianopia, some motor and sensory paresis of the left side, and innervation-apraxia of the fingers of both hands were also present. They distinguish this "parietal agraphia and alexia" as a definite clinical type, attributable to lesions involving the supramarginal gyrus and its immediate vicinity. They conclude that writing is bilaterally represented in the cortex, sharing this bilaterality with other components of speech but not with all. Some attention is given to agraphia of frontal origin, and to the occurrence of agraphia with other aphasic symptoms in lesions of temporoparietal site. It is rather by the accompaniments of agraphia in a syndrome than by that symptom alone that distinctions can be drawn between the varieties resulting from lesions in the three above-mentioned areas.

Included in the volume is an examination of a large number of recorded cases of agraphia, and sections are devoted to discussion of the relation of agraphia to apraxia, to micro- and macrographia, to so-called paligraphia, and "Lautagraphie." The conceptions of Bastian, Pick, von Monakow, Wernicke, Henschen, and Mingazzini in regard to agraphia receive attention. Thus it may be said the monograph is comprehensive in a noteworthy degree, but it is rather unwieldy and somewhat wordy, and its value would not have been impaired by greater succinctness and by more frequent summaries of the argument.

TOXICOLOGY.

Fifteenth edition. By ALBERT H. BRUNDAGE, A.M., M.D., Phar.D., M.S., Consulting Toxicologist to the Bushwick Hospital, New York. London: D. Appleton and Company. 1926. Pp. 444. 18s.

THERE can be no doubt that the author of a book which has reached its fifteenth edition has been able to provide his readers with reliable information. Once a reputation is established, however, there may be loss of efficiency unless each edition is subjected to critical revision and any necessary additions carefully incorporated. Unfortunately, in this fifteenth edition of Dr. Brundage's work, the sequence of the argument is allowed to suffer. In many instances the page reference to a subject in the index does not direct the reader to the right place in the text. Eight times the continuity of the page numbers is broken to introduce *a*, *b*, and *c*, &c., pages; a most inconvenient arrangement and probably responsible for the inaccuracy of the index. The symptoms and treatment of aspirin and luminal on pp. 60*e* and *f* are out of place and should have appeared in part two which deals with poisons alphabetically, and commences on p. 61. Toxicology has been defined as the science of poisons, and accepting this definition even in its broadest sense, it is difficult to understand the inclusion of a complete scheme of infant feeding occupying 22 pages. The author's apologia for the inclusion of the infant feeding section appears to be the possibility of a poisoned mother being unable to feed her child naturally, but this might well have been omitted and more space allotted to the important section of toxicology dealing with the post-mortem findings which is only allowed 20 pages. A number of sections in Dr. Brundage's work are very valuable. Of these the classification of symptoms which various poisons may produce and the tabulation of substances causing change of colour in urine and fæces may be cited as examples. A most useful inclusion is that of a full glossary of the composition of patent medicines. There is no doubt that Dr. Brundage's book will continue to prove of great value to those who are suddenly called to diagnose and treat a case of poisoning.

Lead Poisoning. (Medicine Monographs, Vol. VII.) By JOSEPH C. AUB and Others. From the Department of Physiology, Harvard School of Public Health, and the Medical Clinic, Massachusetts General Hospital. London: Baillière, Tindall and Cox. 1926. Pp. 265. 18s.

THE issue of this volume, the seventh of the series, was rendered possible by the Harvard Medical School, from funds placed at their disposal by the National Lead Institute. They were fortunate in obtaining the services of Dr. Aub and his collaborators, for their work is a notable contribution to medical science. It would be interesting to learn what is the constitution and what are the functions of the National Lead Institute. Are its members drawn from those engaged in the commercial production of lead and its compounds as well as from the scientific professions, including medicine? An institution with such a

combination of members would be of real value to the community, for conflicting interests might be freely discussed within their walls. In any case an organisation which gives facilities for the production of works such as Dr. Aub's places us in its debt.

The volume is divided into four parts, chemical, pathological, physiological, and clinical. In the chemical section the solubility of lead and its compounds in the body fluids is stressed. A good case is made out for the circulation and deposition in the tissues of lead combined with the phosphate radicle, and experimental work quoted shows that such an event is likely under the hydrogen-ion concentration normally found in blood and tissues. Analyses of organs of those who are well known to have ingested lead show that not only is the majority of lead found in the bones, but that it may be found in this situation when its detection has failed elsewhere. The pathological section attempts to correlate the clinical and pathological states and a full classification of lesions which may be found is given. In the physiological section the effect of lead on the blood cells is described in detail and the chief signs and symptoms of plumbism are discussed on a physiological basis. The experimental work here described on normal erythrocytes and artificially "leaded" cells is noteworthy. The clinical section pays special attention to the difficult problem of the early diagnosis of chronic plumbism. Administration of phosphoric acid and the limitation, as far as possible, of calcium in the diet have proved the most valuable "deleading" measure in the hands of Dr. Aub and his colleagues; they bring forward experimental work which suggests a similarity between calcium and lead metabolism.

There are two important effects of lead which receive but cursory mention—sterility and abortion. It is true that an attempt is made to explain the latter, but the much discussed question of the affinity of lead for embryonic and rapidly growing tissues, and the findings of excessive quantities of lead in the placenta of those suffering from lead poisoning are worthy of a more complete study than is here devoted to them. One sentence in this book (p. 239) should be pondered by all those concerned with industrial health. The author states: "In almost all cases of industrial plumbism and in all serious cases, it will be found that the workman has been poisoned by lead which entered his body with the inspired air."

BIOLOGY.

Biological Monographs and Manuals. No. VI. The Anatomy, Histology, and Development of the Pituitary Body. By G. R. DE BEER, M.A., B.Sc., F.L.S., Fellow of Merton College, and Jenkinson Memorial Lecturer in Comparative and Experimental Embryology in the University of Oxford. London and Edinburgh: Oliver and Boyd. 1926. Pp. 118. 12*s.* 6*d.*

AN excellent little book. As may be inferred from the title, the work is not concerned with considerations of the physiological functions of the pituitary body, but with its morphology, and contains short and clear accounts of its structure, development, and histology in the various divisions of the vertebrates. The author works through his subject from the mammals down to the Cyclostomes. We turned with great interest to his account of the conditions in Selachians, for it has been held that the organ in this group does not answer the physiological tests which are positive among other Craniata. We have no indication of Dr. de Beer's views on this particular matter, but he gives an account of the structure of the gland in these fishes which seems to put it definitely in line with the others, a fact which one would anticipate from its development. Attention might be called, however, to his statement (p. 68) of the existence of certain curious large cells in the ventral lobe, about 20 or 30 feet in diameter; a printer's error must be held responsible for this overstatement. The author brings out well the interesting and important connexion of the hypophysial pouch with the premandibular somites in some lower forms, and the consequent existence in them of representatives of "proboscis pores," although no doubt some will probably not see eye to eye with him in his deductions from the occurrences. The little work is one which every comparative anatomist and embryologist should have for handy reference. In addition to its excellent illustrations, it is completed by a bibliography which gives all the writers on the subject since the publication of Stendell's exhaustive list in 1914.

The Memory Factor in Biology. By C. J. PATTEN, M.A., M.D., Sc.D. London: Baillière, Tindall and Cox. 1926. Pp. 175. 5*s.*

THE professor of anatomy in the University of Sheffield adds a lively interest in nature, and especially in birds, to his other occupations, and he has put together out of a number of popular addresses a statement of the psychical side of his biology. Any form of dualism he entirely rejects, and he presents an elementary summary of the conception that the world is a unitary whole and that in memory of one kind and another we should recognise the immaterial part of our being. Students of Samuel Butler and his "unconscious memory" will be familiar with much that Prof. Patten has to say; his book is an edifying antidote to the dissecting room and will be of value if it stimulates its readers to dig deeper into the literature of the subject.

MANUAL OF SURGERY.

Vol. III. Seventh edition. By the late ALEXIS THOMSON, M.D., F.R.C.S. Ed. and Eng., and ALEXANDER MILES, M.D., LL.D., F.R.C.S. Ed. London: Oxford University Press. 1926. Pp. 567. 12*s.* 6*d.*

THIS third volume completes the new edition of the Manual of Surgery and, including as it does the whole of the surgery of the chest and abdomen, it forms the most interesting volume of the series. It has been brought well up to date and contains a vast amount of information; the clear arrangement which has been adopted makes access to any particular subject an easy matter. It is profusely illustrated both by photographs of actual cases and diagrams. The former illustrate for the most part rare and extreme conditions and will, perhaps, appeal more to the experienced surgeon. The diagrams are well chosen and should be of great assistance to the student in enabling him to understand the pathology of such complicated conditions as rectal fistulæ and pancreatic cysts. The volume fully maintains the standard of its predecessors.

ANATOMIE DES MEMBRES.

Second edition. By Ch. DUJARIER, Chirurgien de l'Hôpital Boucicaut. Paris: Masson et Cie. Pp. 422. Fr.45.

THIS edition is practically a reprint of the first, which has proved a success among the students for whom it was originally written. The book is of the nature of a dissecting manual, if such a name can be given to one of this size, and deals with its subject from the point of view of the dissector. It is interesting to note in this connexion that the author does not hesitate to introduce so-called "abnormalities" in his illustrations, his object being to show conditions as they may be met with in the dissecting room, rather than to confine himself to an account of the accepted type as if it were unalterable. The directions for dissection, although probably sufficient, do not err on the side of excess, but the descriptions of the regions are good, full, and clear. The illustrations are also to be commended, and in many cases show the influence of Farabeuf, some of whose actual figures are also introduced. Farabeuf, whose style of drawing was in some respects apparently derived from Vesalius, although, of course, with immense improvement, was the author's teacher in anatomy, and the book is dedicated to him.

COMPARATIVE ANATOMY OF VERTEBRATES.

Third edition. By J. S. KINGSLEY, Emeritus Professor of Zoology in the University of Illinois. Philadelphia: P. Blakiston's Sons and Co. 1926. Pp. 470.

NINE years have elapsed since the last edition of this work appeared, so that we welcome this issue. The book has increased in size considerably, and many new figures have found their way into it, but it still retains those characteristics which have made it such a favourite in the past. Prof. Kingsley is an authority on the subject on which he has written, and has produced a text-book which will be the standard one in the English tongue for many years to come. The book is beautifully produced and admirably illustrated.

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CRUSTLESS CHEDDAR AND CHESHIRE CHEESES.

(WILTS UNITED DAIRIES, LTD., TROWBRIDGE, WILTS.)

THESE cheeses are stated to be made from full cream milk. Packet cheeses are imported which are described as of Cheddar flavour, whereas the products of the Wilts United Dairies claim to be actually Cheddar and Cheshire cheeses. The method of packing each of the six sections in a box in "silver paper" prevents contamination. Both cheeses possessed an agreeable and pleasant flavour characteristic of their types. On analysis the following results were obtained:—

	Cheddar.	Cheshire.
Weight of each section	35·6 grammes.	37·4 grammes.
Moisture	44·1 per cent.	43·5 per cent.
Total ash	3·06 „	3·24 „
containing salt (NaCl)	1·17 „	1·23 „
Protein	22·06 „	22·06 „
Fat	27·84 „	27·00 „
Lactic acid	1·40 „	1·40 „
Undetermined	1·54 „	2·80 „
Calorie value per lb.	1586	1551
Preservatives	Absent.	Absent.

The absence of sugar is of some significance for diabetic patients.

"TABLOID" DIGITALIS LEAF (GR. ½).

(BURROUGHS WELLCOME AND CO., SNOW HILL BUILDINGS, LONDON, E.C.)

In THE LANCET, Oct. 24th, 1925, we called attention to "Tabloid" Digitalis Leaf (gr. 1). This has proved such a satisfactory and efficient means of administering the drug, that Messrs. Burroughs Wellcome and Co., in order to meet the demands of medical practitioners who wish to employ smaller doses, have now prepared tabloids containing half-grain doses (0·032 gr.), put up in bottles of 25 and 100.

CROMESSOL.

(CROMESSOL COMPANY, 140–148, BRAND-STREET, IBROX, GLASGOW S.W.)

We have received a sample of this pleasantly scented disinfectant and germicide. The basis of the preparation is formaldehyde, but essential oils which enter into its composition ensure that the pungent characteristics are considerably modified. Used according to directions and with the fine spray supplied by the Cromessol Company, offices and buildings can be quickly filled with a vapour which should effectively prevent the growth of noxious germs. The claims made for the preparation are entirely based on its protective value. Cromessol is prepared with the eau de cologne, verbena, lavender, and other essential oils and the preparation, which can also be used in the bath, does no injury to fabrics. Tested against 24-hour cultures of *B. typhosus* and *B. diphtheriæ* under similar conditions the disinfectant has been found to possess the germicidal power of standard carbolic acid solution, while the growth of *B. anthracis* was greatly inhibited. The effect of spraying upon vermin was marked; lice do not live more than six hours after being sprayed.

CREO-TERPIN COMPOUND (WAMPOLE).

(MESSRS. H. K. WAMPOLE AND CO., PERTH, ONTARIO. AGENTS: MESSRS. FRANCIS NEWBERY AND SONS, LTD., 31–33, BANNER-STREET, LONDON, E.C.)

Each fluid ounce of this preparation contains chloroform 1 min., terpin hydrate 4 gr., creosote purified 4 min., calcium glycerophosphate 4 gr., and sodium glycerophosphate 4 gr., with 26 per cent. of alcohol. The action of the compound is expectorant and deodorant. Used in bronchial complaints it is claimed to check cough and render the secretion less tenacious, while appetite tends to improve. Medical men may like to see how far these valuable actions would assist in the treatment of troublesome symptoms associated with asthma, whooping-cough, and catarrhal conditions of the respiratory tract. The compound is put up in 8 oz. and 16 oz. bottles, the suggested dosage being, for adults, one to two teaspoonfuls every three or four hours well diluted with water, and for children, according to age, from ten drops to half a teaspoonful. In coughs of a spasmodic or irritating nature, it is recommended that the dose should be held in the throat for a short time or used as a gargle before swallowing.

ALLISATIN TABLETS.

(SANDOZ CHEMICAL CO., LTD., PHARMACEUTICAL DEPT., BRADFORD.)

These tablets are a method of administering allium sativum in which the odour and flavour of the garlic have been got rid of by treatment with vegetable charcoal. It is claimed that, whereas other preparations of garlic present only a comparatively small quantity of some of the constituents of the plant, these tablets, each one of which contains 15 gr. of the fresh drug, employ the total sulphurous principles. There is good evidence that garlic is of service in gastro-intestinal affections, and a recent paper in the *Münchener Medizinische Wochenschrift* assumes this to be acknowledged, and, in particular reference to Allisatin, enumerates cases where improvement has followed its administration, while admitting the action of garlic to be not easily explained. Preposterous claims have been made for garlic with the result that its sensible indications may have been overlooked.

(1) NORMACOL: (2) NEO-REARGON.

(H. R. NAPP, LTD., 3–4, CLEMENTS INN, KINGSWAY, LONDON, W.C.)

"Normacol" consists of desiccated plant-mucus in combination with a small proportion of frangula glucosides, a crystalline glucoside extracted from the alder buckthorn, whose laxative properties are recognised. Administered in the treatment of constipation, the action of the drug is clearly intelligible. Owing to the property of expansion which the desiccated plant-mucus possesses, the effect is to expand the intestines and thereby lead to a defæcation reflex, while the glucoside is present in a proportion not sufficient to create an evacuation of the bowels, but sufficient to assist in the general action. There is no chemical irritant included, and the clinical tests suggest perfect safety for the administration of suitable doses to adults or children.

"Neo-Reargon" is a compound of anthraquinone glucosides and silver in ionised form, designed for the treatment of gonorrhœa of the anterior urethra in either acute or subacute form. The treatment is free from irritation, and with the absence of painful symptoms it is possible for the surgeon to proceed rapidly in an established case or to attempt an abortive result. Charts showing the strength of solution required in the various indications will be supplied to the medical profession, many of whom, we are informed, displayed much interest in the product at the recent London medical exhibition.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 27, 1926.

PLUMBISM AND ITS AVOIDANCE.

THE Lead Paint (Protection against Poisoning) Bill has been debated as though the choice lay between regulating the use of lead paint and prohibiting it altogether. Prohibition is a policy unlikely to be adopted by the present Parliament without prolonged controversy. The choice may, therefore, be otherwise stated; it lies between obtaining regulation before Christmas and obtaining no legislation on the subject at all for some time. It has been said that the prohibition of lead paint in this country would reduce painting work by 40 per cent., and the Government is naturally loth to disturb industry or to increase unemployment unless it is absolutely necessary. It undertakes, however, to bring in a Bill to prohibit lead paint if the proposed regulations fail to give the protection now hoped for, meanwhile asking that the regulations be given a trial. The Bill gives some idea of the scope of these regulations. They may, where buildings are being painted, prohibit the use of any lead compound except in the form of paste or paint ready for use; they may prohibit dry rubbing down and scraping; they may deal with the danger of applying lead paint in the form of spray; they may provide for periodical medical examination and for the non-employment of persons whose health appears likely to suffer; they may secure washing facilities for painters both during and after work; and they may provide for protective clothing and the distribution of instructions as to the hygienic precautions to be taken. Finally, Clause 2 of the Bill, following the Geneva Convention, prohibits the employment of women and children in the painting of any part of a building with lead paint, on the grounds that in the case of women there is a greater susceptibility to lead poisoning, more rapid intoxication, and graver racial consequences. Politically the exclusion of women is resented by the advocates of sex equality, though similar exclusions have been upon our statute-book for 35 years and though two fresh instances were enacted in 1920 without evoking much protest. The other opposition to the Bill comes partly from those who do not wish to see any further interference with industry by Government departments, but mainly from those who will not accept mere regulation of an industrial risk which, they say, should be altogether abolished. They demand the prohibition agreed upon by the Geneva Convention and will not accept the half-loaf now offered. Mere regulation, they consider, can never safeguard the ordinary house painter who works in private dwellings either by himself or in small groups and thus cannot be subject to adequate official inspection. Britain, they say, agreed to prohibition at Geneva and she must not dishonour her signature; the country which has led the world in welfare legislation must not turn reactionary now. The defenders of the Bill reply that there was no signature to dishonour, and that this country in no way bound itself to any course of action; they believe that regulation can make the industry reasonably safe. Trade-unions will tell their members of the risks and the prescribed precautions, and medical examination will play its part in detecting the onset of disease. Medical science is thus expected to answer two main questions: Can any—and, if so, what—regulations sufficiently protect the lead paint worker? and Have women a special susceptibility to lead? In another column (p. 1132) we summarise some of the evidence on these two questions.

Some industries have had experience of the value or otherwise of regulations, though the statistics as to lead poisoning in the potteries are being freely used by both sides. According to British experience, white lead manufacture, work in potteries, and metal smelting seem to carry a graver risk of plumbism than painting, and it appears that in any lead trade the chief danger is from dust or fumes. Many authorities, especially in this country, consider that lead enters the system chiefly through the respiratory tract. Others regard the digestive tract as the principal channel of entry, and it has been stated that experiment shows that whereas only 12 per cent. of lead dust enters the lungs, about 70 per cent. enters the digestive tract after settling in mouth or nose. "Whatever be the truth," as the International Labour Office[1] says, "this discussion, from the practical point of view, is of only secondary importance, the campaign being really waged against the great enemy—dust." How, then, does lead affect workers in paint? The painter using paint already mixed incurs only the slight risk of ingesting small amounts of lead—e.g., from his paint-smeared fingers. But if he uses sand-paper on painted surfaces by the dry process, he inhales large quantities of dust. The regulations prohibit this dry process, and their supporters expect much from this provision. The Bill does not, however, specifically guard against the inhalation of lead oxides when the workman burns off paint with a blow-pipe, which is regrettable since inhalation of small amounts of insoluble lead compounds may be very dangerous. It is, indeed, a characteristic of lead that it acts in very small doses. The amount required to set up chronic plumbism has been estimated as low as 1 mg. of dust inhaled daily, and 10 mg. sets up severe symptoms in a short time, though there is reason to think that animals and human beings may acquire a tolerance under certain conditions. American and German research shows that lead compounds, inhaled and ingested, are stored as an insoluble phosphate in the skeleton. This may be gradually mobilised and excreted, and in passing through the blood stream may produce toxic symptoms. Detailed analyses of human tissues have proved that workers in dusty lead trades may have from 0·5 to 1·0 g. of lead phosphate in the skeleton. In the course of a speech against the Bill in the House of Lords on Nov. 18th, Lord DAWSON referred to the use which could be made in industry of a biochemical test for the susceptibility of individuals to lead and the degree of poisoning reached, and there is no doubt that if so dangerous a substance as lead is to be employed at all the workers ought to be frequently and carefully examined, not merely for crude paralyses but for slight deviations from health. The Government describes its proposals as an experiment, and it is an experiment that will only succeed if employees are kept under thoroughly efficient medical supervision. The Government's opponents describe the experiment as gambling with men's lives, but as we have pointed out, the choice at present appears to be between the regulations and nothing, and it is gambling with lives to leave things as they stand. The Government has given its pledge to introduce prohibitive legislation if the present regulations fail and in the meantime it would be well to accept substantially

[1] International Labour Office, 1926. Brochure No. 54: Lead Poisoning.

what is offered. It is regrettable that the system of control rather than prohibition will involve further inspection and State interference with an industry, but an element of compulsion does not necessarily exclude the education which is the only satisfactory basis of industrial hygiene. Education should be all that is needed, for it is to the interest of everybody —employer and employee—that poisoning should not occur. The continued existence of the problem, however, seems to show that education requires temporary reinforcement.

The attempt to prevent women from working with lead paint has given rise to much controversy. The argument that women (or men) can be left to look after themselves is unconvincing; if it were accepted it would mean that the State should never introduce legislation governing the conduct of factories; it ignores the unpleasant fact that many workers in this country to-day are forced by circumstances into certain forms of employment whether injurious or not. The Government's proposal to exclude women suggests a lack of faith in the new regulations as a safeguard against lead poisoning. Granted that a considerable risk is still being run the exclusion is based on (1) the higher susceptibility of women, (2) the graver effects of poisoning in women, and (3) the danger of lead producing abortion or the early death of children. Evidence on each of these questions will be found in the special article referred to. There is no doubt that the older statistics on lead poisoning in women are largely fallacious because women were given the most dangerous jobs in the industry and were badly paid and underfed. The International Labour Office [2] states that "while English opinion inclines to the view that women are more susceptible to the action of lead than men this is not accepted by German writers who consider that their poor state of nutrition, poverty, industrial fatigue, added to housework, long hair, and type of clothing favouring the accumulation of a greater quantity of the poison upon them, are sufficiently potent factors to account for the apparent disparity. Data from the United States are not sufficient to allow the experts to support either of these views. All, however, agree that in women lead poisoning assumes a more severe form. . . . than in men." This is a very important fact; but when supporters of exclusion speak of the effect of lead on female fertility they are certainly not on sure ground, for chronic poisoning of the father appears to be almost as damaging to the ovum as chronic poisoning of the mother. Lord HALDANE will have sympathy for his plea for further medical guidance on this question before rash assumptions are made. The general admission that lead poisoning does more damage when it affects the female is a sufficient ground, perhaps, for excluding women from the industry as at present conducted, but the new regulations will be a failure unless they make the work reasonably safe both for men and women.

ACUTE POLIOMYELITIS.

ACUTE poliomyelitis is regarded with particular anxiety by the physician, for he cannot say, in a given case, whether the crippling and disabling sequelæ will make their appearance in a mild or in an aggravated form, and cannot determine from the prodromal symptoms whether involvement or escape is to be the upshot. No clear relation has as yet been established between the mildness or otherwise of the initial syndrome and of the paralytic consequences, so that the knowledge that the cases in which the latter develop actually constitute the minority is but cold comfort. Unfortunately there is a clinical type, also, in which the early febrile symptoms are so trifling as practically to escape notice, amounting in some instances to nothing more than a headache; the fulminant onset of paralysis in some such cases exemplifies the serious nature of the disease's uncertainties. Again, even when invasion of the lower motor neurones, restricted or widespread though it be, is clinically obvious, prognosis as regards recovery cannot readily be estimated by any known criteria, for the residual incapacity bears no constant relation to the severity of the symptoms during the first few days. If such means as we at present possess for a rational treatment of epidemic poliomyelitis are to be of any service, it is clearly imperative that the condition should be diagnosed in the pre-paralytic stage—during those precious two or three days that in the great majority of cases supervene between the febrile onset with malaise and the revelation of lesions in brain or cord by paretic or paralytic symptoms. When epidemic disease of whatever kind is raging the profession and the public are on the alert, and there is considerably less likelihood of abortive and incomplete cases being missed; in respect of poliomyelitis at the present time we may believe that an attitude of watchful and solicitous care has been adopted by all whom it concerns. To diagnose the disease at the earliest, the following considerations are apposite. As a rule the illness is not so severe or so obvious as to "fell" the child and make it take to its bed at once. With a moderate rise of temperature, headache, sickness, malaise, possibly with mild catarrh or throat symptoms, there is no outstanding clinical feature to suggest any one infective condition rather than another; should spontaneous pains be complained of, in neck, back, or limbs, with or without a corresponding hyperæsthesia, the indications point more specifically to irritative phenomena on a meningeal basis. Lumbar puncture must in any and every case of this kind be performed at once if suspicion is aroused; by fluid examination varieties of meningitis can be differentiated from poliomyelitis, and the latter can be distinguished by the increase of cells, which is a constant feature of this pre-paralytic stage, by normal glucose and chlorides, and by little or no protein change. The cells vary from, say, 30 up to many hundreds per c.mm., some 60 to 90 per cent. being polymorphonuclear. A fluid finding of this kind, with absence of organisms, is highly suggestive of acute poliomyelitis, and much less indicative of epidemic or lethargic encephalitis, since in the latter the polymorphonuclear element is almost entirely absent from the cytology. Finally, in this connexion, the pre-paralytic period is signalised by diminution or loss of the deep reflexes in many cases, sometimes as long as 24 hours before actual paralysis is detected.

Should the application of these considerations to a particular case enable the observer to make an accurate diagnosis, the sole *specific* treatment consists in intraspinous injection of immune serum, a method which has been used with success in previous epidemics. To obtain this serum is the difficulty. It is known that an attack of poliomyelitis confers immunity on its subject for years, and that the patient's serum remains active against the disease for a very long time. But how, as a matter of practical therapeutics, can the physician find a convalescent or an old case at hand, the patient being willing to give the necessary blood, precisely when an acute case of poliomyelitis

[2] Ibid.

in the pre-paralytic period presents itself for immediate treatment? If this difficulty can be met, the procedure is simple enough; the serum is separated from, say, 30 c.cm. of the giver's blood, obtained by venepuncture, warmed, and injected into the spinal theca by the lumbar route in amount corresponding to the quantity of fluid withdrawn—say from 4 to 12 c.cm. This treatment can be repeated daily for some days. It is useless except when employed before the paralysis has set in definitely, or in cases of a progressive ascending character. Efforts have been made by many workers to obtain varieties of animal sera which have been appropriately treated so as to contain actively immunising bodies, but as yet the results have been uniformly disappointing. One of the great difficulties, as FLEXNER and AMOSS[1] have emphasised, is that only two varieties of the virus of poliomyelitis have as yet become known; one is too weak to excite any reaction in the experimental animal, and the other is so strong as to induce severe paralytic effects in the monkey. Artificial attenuation of the virus must somehow be effected before further advance can be made. No medicinal agent hitherto has been proved to exercise a beneficial influence on the course taken by the disease, but much can be done to minimise the ultimate sequelæ by insisting on absolute rest in bed, at least for three weeks, and by concentrating on the muscles that are affected. What the physician must aim at is to obtain the "zero position" for them—i.e., that position in which a given muscle is completely relaxed and its opposing muscle is prevented mechanically from exercising its action, by appropriate splinting or the use of plaster "shells." If weak muscles are placed in a position of relaxation from the outset, many of the deformities of the later stages will be effectually prevented. Individual thought is obviously required for each case, but the principles are the same in all—no loading or stretching of an atonic muscle is to be allowed. Bearing in mind the spinal site of the lesions, the physician will utilise all available means to maintain the nutrition of the affected muscles until such time as recovery takes place from within. Hence there is a place in his therapeutic scheme for the employment of warmth to the limb or limbs, skin friction, warm baths and douches, and gentle massage and movements; the former should be carried out from the beginning, the latter after the first week or two are over. Electrical applications of a stimulating kind are probably less advantageous than is commonly supposed, and in any case are not called for at the early stage.

The incubation period of poliomyelitis has been determined within the range of from four or five days to ten or twelve. Being infective if not infectious it requires that isolation should be adopted; according to the experience of many observers, in a hospital bed-isolation suffices. The virus has been found in the nasal, buccal, and pharyngeal mucous secretions both of patients and of contacts and others who have exhibited no nervous symptoms and sometimes no general symptoms. It is a good plan, therefore, for the practitioner to insist on regular nasal and throat douching or gargling with washes of potassium permanganate or some variety of chlorine-containing solution, on the part of contacts and patients alike. The evidence of the spread of infection by schools is certainly not strong, just as that of spread through a ward of a general hospital is for all practical purposes nil. In one of the Massachusetts epidemics only 35 patients out of 150 cases were attending school, and of the 35 no less than 22 attended different schools. The occurrence of the disease in institutions is as a fact extremely rare. In view of what was said above of the incubation time, a quarantine of a fortnight before contacts return to school should be sufficient. More difficult to evaluate is the period at which infected patients may be considered free from infection. Possibly the virus remains in the mucosæ for months. Those cases which recover quickly are perhaps less serious in this respect; one month at least should elapse after convalescence is complete ere the patient is allowed to resume his place at school. The view here adopted was well set out 15 years ago in a paper by the late Dr. F. E. BATTEN, communicated to the Association of Medical Officers of Schools.

[1] Journal of Experimental Medicine, 1924, xxxix., 625.

FOG AND MORTALITY.

WE publish elsewhere in this issue an interesting study by Mr. W. T. RUSSELL, from the Medical Research Council's Statistical Department, of the arithmetical relation between temperature and fogginess on the one hand and mortality from respiratory disease on the other. This paper well illustrates both the strength and the weakness of the statistical method in such problems.

The strength of the method resides in this, that it enables one to give a *rational* answer to the sort of question we are always asking. We are all of us, medical men and laymen, prone to seek some numerical answer to such questions as—How many lives would be saved annually if tuberculosis were conquered? How many lives are saved annually by the reduction of infant mortality?—and in this class of question one directed to the numerical saving of life to be attained by a less barbarous utilisation of fuel is often to be found. But the common way of answering such questions is somewhat crude. It consists in comparing the mortality over a period when the factor whose influence we desire to measure is operating intensely, either with some average mortality or with the mortality in some other period when these factors were less in evidence. Thus we find the greatest of medical statisticians, WILLIAM FARR, writing: "The effects of the cold of the five weeks that ended on 19th of December (1874) have been tested in the same way by comparing the deaths at each age with the deaths in the five previous average weeks. The deaths were raised from 6967 to 9871; so the excess due to cold was 2904 in the five weeks, and on an average 581 weekly." FARR—who was fully alive to the many statistical difficulties, indeed he said that any investigation which "is confined in its scope to *mean* temperatures must be imperfect"—would have been the first to admit that this is too summary a way of assessing damages. The modern statistical calculus provides a better measure. Mr. RUSSELL did not have to confine himself to contrasting particular periods; he could measure the average relation. While to obtain a numerical assessment of the damages chargeable to fog and temperature, his equation which tells us how much for each fall of a degree of temperature below the normal for season or for each unit change in the measure of fog the number of deaths will be altered. For instance, in his most favourable case, the deaths of the nineteenth week of the year related to the temperature and fog of the previous week, a change of one degree of mean air temperature corresponds to an increase or decrease of nearly 2 deaths (almost 5 per cent. of the mean mortality in the two boroughs studied) and one unit change in the fog standard corresponds

to 0·25 deaths. Nor is this a mere formal relation, because, as Mr. RUSSELL points out, given the temperature and fog measure of one week, it is possible to make an appreciable closer estimate of the mortality in the following week than if we have not that information.

These considerations show the strength of the method. Its weaknesses are not less apparent. In the first place, as Mr. RUSSELL clearly points out, and as FARR noted 60 years ago, the numerical measure of temperature is very imperfect, while the measure of fogginess is even more open to criticism. In the second place, equations are good servants but bad masters. With the equations provided by Mr. RUSSELL, the injudicious might reach very surprising conclusions. They might conclude that in the fourteenth week of the year fog was a positive benefit to health, the more of it the fewer the deaths, or, worse still, they might conclude that warmish weather with thick fog was much healthier than cold weather with no fog at all. We are not prepared indeed to say that this statement is *certainly* false (we believe it is false), but only that the equations do not demonstrate it to be true. All they amount to is a summarisation of experience over a comparatively narrow range of physical conditions, and to suppose that they hold good beyond the range of observation would be as rash as to expect any interpolation formula to be valid beyond the range of observations; if it were, anybody could be a successful prophet. We may, perhaps, regard it as proven that (1) temperature and mortality from respiratory diseases are substantially correlated; (2) that fogginess and mortality are also correlated, but that the latter relation cannot, upon the present data, be demonstrated to be so close. Rightly to appraise the relative weights of these two factors is impossible without a more precise measure of "fogginess," and, indeed, a differentiation of the various physical types of fog. Such information was not available for the period taken by Mr. RUSSELL, and, since 1890, the return of influenza has greatly complicated the statistical problem. Hence it is probable that it will be long before statisticians can give an answer to the question—What does fogginess cost in lives?—which is not only *rational* but *exact*. We may even hope that, before the statistician has sufficient data to give the answer, urban fogginess will have been abolished on general principles, for the cumulative effect of the evidence that fog is indeed an unmixed evil is overwhelmingly great.

DONATIONS AND BEQUESTS.—Miss Mary Scott Mouat, of Lanthill, Malvern Wells, left £1000 to the Royal Manchester Children's Hospital for the endowment of a bed "in memory of her sister Margaret."—Mr. Arthur Donald Oates, Halifax, left £1000 to the Royal Halifax Infirmary.—Mr. Thomas Oxley, Blackpool, who left estate valued at £32,107, gave £1000 each to the National Institute for the Blind, Great Portland-street, the Y.M.C.A., Sheffield, and the Sheffield Cripples' Aid Association, and, after other bequests, the residue of the property, which will amount to about £20,000, to the Sheffield Royal Infirmary.—Miss Edith Jameson Robinson, Dawlish, Devon, left £1000 each to the Dawlish Cottage Hospital and Dr. Barnardo's Homes.—Messrs. Bourne and Hollingsworth, London, have given £4000 towards the Reconstruction Fund of the Middlesex Hospital as a mark of appreciation of what the Middlesex Hospital does for the benefit of workers in their immediate neighbourhood and for their own employees.—Miss Rachel Pennywick, of Craigie, Perth, besides other bequests, left £1000 each to Perth Royal Infirmary and the Elgin Hospital, and £200 each to Burghmuir Infectious Diseases Hospital, Perth; Hillside Sanatorium, Perth; Friarton Fever Hospital, Perth; and Perth Children's Day Nursery.—Under certain conditions and subject to his wife's life interest, the late Mr. Henry Edwin Fraser, of Glen Albyn, Station-road, Hendon, N.W., left £1025 to Middlesex Hospital for the endowment of a bed.

Annotations.

"Ne quid nimis."

DOCTORS AND STATESMEN.

THE annual dinner of the Royal Society of Medicine on Nov. 18th was marked by three interesting events. One was the presentation of the Society's gold medal to Mr. J. S. Haldane for his great services to medicine and science. The second was the gift of a seventeenth-century gold chain by Sir StClair Thomson, to be worn by the President as his badge of office. The third was the presence of the Rt. Hon. Stanley Baldwin as guest of the evening. The Prime Minister took advantage of the toast of "The Society" to make a happy speech on the similarity between the functions of medicine and statesmanship. Both professions, he said, owe a profound debt to the Greeks; the common goal of both is the attainment of perfect health and normal balance of function. Both deal with an infinitely complex assembly of growing structure, never at rest, and subject not only to distemper but to disease. Both suffer from plenty of quacks and charlatans, who seek to heal the sick by reciting magical formulæ which they call "slogans," and physician and politician alike are apt to have trouble with those members of their callings who either will not or constitutionally cannot keep out of the Press—a rash that appears on the most unexpected persons. Both are subjected to the attacks of those who differ from them. Mr. Baldwin, however, gave to the doctors the advantage in that they do sometimes receive emoluments appropriate to the confidence reposed in them by the public. They have sometimes, too, he said, the inestimable advantage of seeing the results of their work, and those who rise up and call them blessed are beyond all enumeration. For the politician there is only the laying of foundations for generations ahead, and the land he would see is as the hills that are very far off. The temperature of the body politic varies almost as rapidly as temperatures measured by the clinical thermometer. Last May it might well have reached 105°, and there are still symptoms of fever, due to attacks of a very virulent epidemic that the Prime Minister ventured to diagnose as "Russian influenza." Epidemics tend to become less severe as time goes on, but until that disease diminishes in strength or some vaccine to produce immunity is found, he could promise us no relief from intermittent fever. The body politic needed, he said, a Harvey to find out the mysteries of the cyclic ebb and flow of unemployment, but the surgeons, who would operate on the House of Lords as on an appendix, were in his opinion less necessary than physicians.

Sir James Berry said "Happy is the nation that has no history," but went on to indicate that the Royal Society of Medicine may be called a happy nation, or, as the Prime Minister said, an Empire, while its history is of great interest. He referred in appropriate terms to the recent development in the *Proceedings*, and went on to mention the many improvements which have been carried out in the building and equipment during the last twelve months. Sir James Berry dwelt on the ideal to extend the services of the Society to the poorest practitioner, but uttered a serious warning against a too great prevalence of operating. The extension of the already remarkable library facilities, he said, is an earnest of what the Society will accomplish if it gets adequate support, but it is at present hampered by a capital debt of £25,000. Donors, as Sir James Berry said, are attracted to the laboratory, but the research work performed in the Society's library should not be underestimated. Dr. Robert Hutchison, in proposing the health of the guests, continued the Prime Minister's analogy by coupling him with the medical profession under the late Lord Salisbury's encomium of a "great social cement." Sir William

Bragg pointed out in his reply that physicians and physicists had always lived in the closest of alliances, and that when the Royal Society was first founded the physicians of London had been the keenest participants in the exciting early discussions. Sir Berkeley Moynihan, who also replied to the toast, urged it as vital that the medical profession should keep constantly in view their duty of maintaining intimate touch with the lay public and of fulfilling their obligations as citizens, which they did not lay down when they qualified. However the medical profession fails to reach its ideals, it continues to pursue them ardently, and ideals are, he said, not so much for capture as for pursuit. The whole of Sir Berkeley Moynihan's witty speech, in which he made constant happy references to the whimsical fantasies of "The Mikado," was directed to show the necessity that doctors, who in the war had displayed great administrative gifts, as well as technical skill, should in times of peace play a similar part in coöperation with public efforts.

CUTANEOUS XANTHOCHROMIA.

IN 1913 H. van den Bergh, while making investigations on the different pigments in blood serum, drew attention to xanthosis in diabetics and recognised the lipochromic nature of the pigment on which it depended. A little later, Labbé described under the name of xanthochromia palmoplantare an intense yellow coloration of the palms and soles met with more or less frequently in cases of diabetes. His conclusions, after laborious experiments, tended to exclude cholæmia as the cause of the coloration, there being no excess of bilirubin in the serum or urine; the colour seemed attributable to a different pigment of unknown nature. Xanthochromia is observed especially in diabetes and mostly in severe forms of this disease. On the other hand, it may be present in many other affections, such as typhoid fever and in subjects showing the marked disturbance in nutrition which often precedes diabetes. Subsequently Labbé and his pupils conceived the idea that a high cholesterol content of the blood might explain the pigmentation; but they found, after diligent investigation, that xanthochromia did not coincide invariably with hypercholesteræmia, being relatively much less frequent. In fact, conditions of increased cholesterol content are found without there being the least sign of xanthochromia. Thus a marked condition of hypercholesteræmia has been described in various forms of nephritis—precisely in those which are associated with lipoidosis and cholesterinosis of the kidney—and in the course of many hepatic disorders, such as cholelithiasis, Weil's disease, obstructive jaundice, acute yellow atrophy, cirrhosis and cancer of the liver. In tuberculosis, especially when of long standing and with amyloid degeneration, there may be hypercholesteræmia, as also in severe forms of anæmia, and in syphilis, chronic alcoholism, and arterio-sclerosis. Among physiological conditions characterised by constant hypercholesteræmia are pregnancy, the menopause, and, to a slighter degree, senility. Yet in none of these conditions with a constant more or less high blood content of cholesterin is there a concomitant xanthochromia. Dr. V. R. Peretti, of the University of Naples, has recently published[1] some investigations on the subject which are of interest. It is known that the pigment which colours the serum is a lipochrome, lutein, a complex hydrocarbon of the aromatic group; it may be estimated in the blood by van den Bergh's method. Dr. Peretti made observations on 17 cases, and found that seven were diabetics, with xanthochromia, cholesteræmia and lipochromia; five were diabetics without xanthochromia or lipochromia, but with cholesteræmia only; two were obese subjects not diabetic, but with acidosis, xanthochromia, and lipochromia; and three were rare and spurious cases of xanthochromia and lipochromia in patients who were not diabetic and had no cholesteræmia. It will be seen that in these seven cases lipochrome bore a definite relation to the xanthochromia and was associated with a high cholesterol content; yet hypercholesteræmia occurred also in the five cases in which there was no xanthochromia. Moreover, it appears that the lipochrome content varied proportionately to the intensity and extent of the xanthochromia. A priori, therefore, it must be admitted that xanthochromia is due to the accumulation of lipochrome in the blood and tissues. This conclusion is confirmed by the three spurious cases, in which there was xanthochromia without diabetes or cholesteræmia, in whom lipochrome was also found. As regards the origin of lipochrome, van den Bergh found by experiments that it was possible to vary the amount of it in the blood by giving substances alternatively rich or poor in such pigments; he isolated and called carotin and xanthophylla, pigments contained in carrots and green vegetables, and present as lutein in egg-yolk, where they, apparently, facilitate the combustion of fats. Dr. James Oliver has recently called attention[2] to carotin in the blood-serum as a probable halogen-carrier. But the importance of diet in explaining lipochromia—however easily assumed and suggestive—does not carry full conviction, since it is a matter of daily observation that not all diabetics who are on a largely vegetarian régime, nor the tuberculous, who eat large quantities of eggs, show signs of xanthochromia. The lipochrome introduced into the organism does not remain there passively or indefinitely, but is either destroyed internally or eliminated by the excretions, and the conclusion which this suggests is that the essential cause of xanthochromia is to be found in the patient's incapacity to get rid of the ingested lipochrome by excretion or destruction. Dr. Peretti lays the blame on faulty general metabolism, and in favour of this cites the fact that diabetics with severe and extensive xanthochromia show a marked disturbance in fat metabolism, a defect in the combustion of the ketonic fatty acids, and an accumulation of cholesterol. In the same way xanthochromia is met with in the obese, who, although not diabetic, present an almost chronic acidosis, indicative of inefficient fat metabolism. The most satisfactory conclusion to be drawn from all this evidence seems to be that xanthochromia palmoplantare should be considered as a phenomenon of purely clinical interest, since it has no serious prognostic significance.

[1] Gazzetta degli Ospedali e delle Cliniche. No. 41. Oct. 10th, 1926.

THE 1924 OUTBREAK OF ENCEPHALITIS IN SHEFFIELD.

THE last plague to escape from Pandora's box has proved in some ways to be the worst, although, in the Report[3] before us, Prof. F. E. Wynne says that statistical estimates of the fatality of epidemic encephalitis should be accepted with reserve owing to the occurrence of unrecognised mild and abortive cases. The main features of the Sheffield outbreak of 1924 have already been set out in our columns, and this Report contains the considered opinions of epidemiologist, pathologist, and clinician upon its lessons. Prof. Wynne is unable to establish any relation between the disease and social conditions, such as overcrowding, poverty, or insanitary housing, nor any relation with site, water, milk or food-supply. There is no trustworthy evidence that it is spread by direct contact nor any data for computing an incubation period. The only positive evidence concerns the greater liability to infection in males and the greater liability to die of the disease in females. Prof. J. S. C. Douglas's pathological report is brief, for the results closely corresponded with those found in other outbreaks. In the clinical report by Prof. A. J. Hall and Dr. A. G. Yates the difficulty of diagnosis is emphasised, for 16 cases notified as epidemic

[2] Med. Press and Circular, Nov. 17th, 1926.

[3] Medical Research Council. Special Report Series No. 108. The Sheffield Outbreak of Epidemic Encephalitis in 1924. H.M. Stationery Office. 1926. 1s. 9d.

encephalitis proved to be suffering from some other condition. Although about one-half of the cases notified could be described as mild, with a tendency towards complete recovery, Parkinsonism was found not infrequently to follow an attack of extreme mildness. Ocular palsies persisted rarely, although an occasional speech difficulty remained for considerable periods. Mental disorders persist in half the cases in which they were acute in the primary attack. Sleep disorder tended to chronicity, in many cases taking the form of nocturnal insomnia. The occurrence of moral changes during the primary attack was too difficult to assess, so long as the patients were in bed under strict nursing supervision, to afford material for report. Respiratory disorders in the primary attack did not persist in any case. The time of onset of Parkinsonism was most commonly from 6 to 12 months, the facial mask appearing early. Five out of 64 cases so affected have died already, while of the remainder a considerable percentage is getting steadily worse; about half seem to be at a standstill. Of the 43 patients with encephalitis who did not survive, 40 died within two months of onset, two of pneumonia several months later, while one boy died eight months after a mild primary attack of what appeared to be a recurrent acute attack with profound lethargy. An appendix to the Report contains a summary of recent researches by Dr. J. R. Perdrau from the National Institute for Medical Research at Hampstead. Dr. Perdrau's study of immune reactions in the rabbit confirms the contention of Levaditi and others that the causal agent of encephalitis is identical with that of herpes febrilis, except in regard to the greater affinity of the former for the central nervous system. He admits that the theory of herpetic origin has not been universally accepted by research workers, although no other theory has so far been propounded on experimental grounds.

PROLAPSE AND CARCINOMA.

SOME recent reports of the occurrence of carcinoma in a prolapsed uterus only serve to show how surprisingly rare the condition really is. Last March Dr. H. Leith Murray, giving the history of a case[1] to the North of England Obstetrical and Gynæcological Society, said that he had been able to find only one instance of carcinoma with prolapse recorded in the journal of *Obstetrics and Gynæcology of the British Empire*. This was described by Dr. Russell Andrews in 1910 and had something in common with his own, for in both the history of protrusion at the vulva was only recent; in Dr. Murray's the cervix had bled freely ever since its appearance. Before the same society on Oct. 15th Dr. J. W. Bride gave an account of two cases in which prolapse was associated with malignant disease. In the second of them the lesion was a primary carcinoma of the vagina which, he said, might possibly have been caused by neglect of a rubber ring pessary worn during the previous five years. The first case, however, was one of cervical cancer, where no pessary had ever been worn.

The patient was a woman of 50 who had had six children, the last of them ten years ago. She consulted Dr. Bride in June, 1921, complaining of a bad discharge, brownish and watery, and of something coming down. On examination it was found that she had a complete prolapse with hypertrophy and severe ulceration of the cervix. At operation on June 10th, 1921, though the cervix did not seem to be definitely malignant, Dr. Bride removed the uterus by vaginal hysterectomy in the course of an extensive anterior colporrhaphy according to Fothergill's method. The pathologist reported that there was a columnar-celled carcinoma of the cervix and the patient made an uninterrupted recovery. In April, 1925, she returned complaining of a small ulcer on the right labium majus, which had first been noticed in the previous December. The vulva and glands were excised on April 8th and microscopical examination showed epithelioma of the vulva. Recurrence took place at the end of that year and radium was applied on two occasions. She died about three months ago.

Discussing this history, Dr. Bride said that he thought that the association of the columnar-celled cervical carcinoma and the vulval epithelioma was almost certainly fortuitous. At any rate, it appears irrelevant to the question whether prolapse predisposes to cancerous change. In looking at this question it would be reasonable to suppose that a protruded cervix, constantly subject to irritation, would stand a good chance of becoming malignant, but, as Dr. Bride pointed out, authorities such as T. S. Cullen and G. Panton have been able to collect so few cases that they could only regard the coincidence of prolapse and cancer as accidental. There is no doubt that childbearing predisposes to carcinoma of the cervix, and the most generally accepted explanation of this fact is that the laceration so often caused in labour becomes the seat of a chronic inflammation, and this is the starting-point of a new growth. The irritation thus caused can rarely be so great as that suffered by a cervix projecting at the vulva; yet it almost seems as though cancer is less common with prolapse than without it. One explanation that may be put forward to account for its rarity is that ulceration due to protrusion of the cervix seldom lasts long enough to cause cancer of itself. In general a long period elapses between the beginning of ulceration and the development of clinical carcinoma, and presumably, not all patients with chronic ulceration are in such physical condition that they are liable to develop cancer; the number of susceptible persons who suffer for a long period from gross prolapse is probably very small. The same argument—that the latent period is usually long—may be used to explain why pessaries in the vagina so rarely give rise to carcinoma, although they usually set up a mild chronic inflammation and occasionally cause pressure ulcers of the walls. Dr. Bride's case of vaginal cancer quoted above is uncommon enough to prove the rule.

[1] THE LANCET, 1923, i., 910.

THE RED CROSS AND DISASTER RELIEF.

A PICTORIAL supplement to *World's Health* for November shows how intimately the Red Cross movement has become associated with the relief of distress in the face of national calamities. It was from the first the desire of the founders of the League of Red Cross Societies to furnish a medium for coördinating relief work, whether national or international. To improvise relief on the spot is a long, painful and inefficient method, and the League is becoming a clearing-house of information with a view to avoiding duplications and waste of effort. Special reports were presented to the Second Oriental Red Cross Conference which has just concluded its sittings in Tokio. A brilliant example of organised relief was given in America three months ago. It will be remembered that on Sept. 18th a hurricane swept over the Atlantic coast of Florida in a tract 60 miles wide, destroying and damaging numerous buildings and disorganising the electricity, water, and gas services of Miami, a large and popular winter resort. The number of persons killed was 106; 857 were injured, and thousands were rendered homeless. The immediate demand for relief work of all kinds was naturally overwhelming, and help was soon forthcoming from all parts of the Union. From a wealth of determined efforts at rescue that of Chicago stands out as an example of almost perfect team-work and leadership. The initiative, as apparently in most great public enterprises in the States, was taken by the Press, and the *Chicago Herald-Examiner* (the headquarters of the Hearst combine) decided to despatch a relief train to Miami. The civic authorities placed the whole public health service at Mr. Hearst's disposal. The Commissioner of Health, Dr. H. N. Bundesen, to whom we owe a graphic account of the expedition,[1] was made director of the relief unit. The Illinois Central Railroad Company and the Pullman Company provided a special train with five sleepers, a dining car, two luggage vans and full personnel, free of charge. The county government board and the local hospitals allotted 33 physicians and 47 nurses. The train also

[1] Chicago's Health, Oct. 5th, 1926.

carried an X ray apparatus and two operators, an engineer with four complete chlorinator units, ten days' provisions, medical and surgical stores, clothing, ten 100-lb. cylinders of chlorine, and a ton of chloride of lime. The director had a headquarters staff of 12; two assistant directors, a railroad man, a liaison officer, a secretary, two motor-cycle police as messengers, and the sanitary and X ray personnel. Organisation and discipline was on the strictest military lines, and the unit was therefore mobile, highly efficient, and completely self-supporting. The director maintained full telegraphic communication with the civic authorities of the disaster area, and reported on arrival to the chief medical officer of the Citizens' Relief Organisation at his emergency headquarters. Before daybreak the expedition was transported in squads of 7–12 to the stations where their work could be of most value. Some squads worked in 12-hour shifts at emergency hospitals, others made house-to-house calls in outlying villages, relieved the staffs of regular hospitals or fed, clothed, and housed the destitute. In ten days the 100 members of the unit between them did 3945 dressings, performed 4426 operations, and gave 14,651 prophylactic injections.

The work of the sanitary staff was no less strenuous and important. The wells which supply Miami had all been polluted by flood-water. Chlorinators were promptly installed at two of the plants and at the principal station at Hialeah, which was waiting for its power to be restored. Next day the chief sanitary engineer was horrified to learn that Hialeah had come to life and had pumped half a million gallons of raw canal-water into the main to test it. He promptly arranged for chlorination at two points between Hialeah and the city distribution valve, but through some error of the local staff none of the chlorinators were operated and all this contaminated water entered the distribution system, just as the newspapers had sounded the "all clear." It soon appeared also that the operators of the pumping stations were neglecting to use their chlorinators. The director of the unit had to request the Miami Commissioners of Health to appoint shifts of supervising engineers at all stations, with authority to see that no unsterilised water was pumped through. Three days later the water was at last safe to drink. The inhabitants had, however, subsisted on flood-water for five days, and this fact may explain the very large number of antityphoid inoculations given by the medical staff.

The work of the Chicago train was so much appreciated, that when the Miami Commissioner of Health informed the director that the city could carry on by itself, the Mayor and other members of the local relief committee sent lengthy and urgent telegrams to Chicago for a two days' extension of its stay, which was granted. The American Red Cross described the unit officially as the best in every way that any disaster had yet produced, and, indeed, by every local account, it saved the situation.

THE DECLINE OF SYPHILIS IN EUROPE.

AT the first international congress for sexuology held in Berlin a week or two ago, Prof. Josef Jadassohn,[1] the well-known syphilologist of Breslau, reported the result of a questionnaire addressed by him to 51 specialists in 19 countries as to their views on the decline of syphilis and its relation to treatment by salvarsan. Almost all the syphilologists agreed with the explanation proposed at the German Dermatological Society in 1923 when the paramount importance of salvarsan in combating syphilis was emphasised as well as its relative harmlessness, provided proper care was taken in its manufacture and administration. In 14 countries there was unanimity as to the decline of the disease; in Italy six out of seven replies indicated a decline; in Russia statistics supplied by the Government showed a diminution of syphilis, but three practitioners returned a doubtful or negative answer, and one an affirmative; in Hungary and Bulgaria the decline of the disease was doubtful; in France there had been an undoubted decline to the extent of 50 per cent. from 1919 to 1923, but of recent years Jeanselme had observed a recrudescence in Paris and other centres which he attributed to the enormous immigration of foreign workmen and the substitution of bismuth for salvarsan. The decline of syphilis showed a considerable variation in the following countries—viz., in Denmark, Bulgaria, and Sweden by four-fifths, in England and Switzerland by a half, in Holland by three-quarters, and in Italy by a third. In 16 countries gonorrhœa had not diminished or had even actually increased, or lastly shown a decline, but by no means to such an extent as syphilis. Almost all the specialists were unanimous as to the cause of the decline of syphilis, which was to be found pre-eminently in the use of salvarsan. This explanation accounted for the difference between the decline of syphilis and that of gonorrhœa, in which disease treatment had not made any essential progress. More or less importance was attributed to accessory factors such as popular enlightenment, improvement in medical training, and the creation of treatment centres, especially of a gratuitous kind. The question as to whether salvarsan had exercised an influence on the frequency of tabes, general paralysis, and aortitis in a favourable or unfavourable sense was in many cases met by the reply that it was still too early to decide. Several observers declared that they had never seen a case which had been systematically treated with salvarsan from the first develop such sequelæ, and in no instance was an increase of general paralysis attributable to salvarsan. In conclusion, Prof. Jadassohn emphasised the importance of education, abstinence from alcohol, and improvement in housing conditions in the campaign against venereal disease.

[1] Forschungen und Fortschritte, Nov. 10th, 1926.

EPIDEMIC PREVENTION IN CHINA.

SINCE the establishment of the National Epidemic Prevention Bureau at Peking in 1919 only two annual reports have been issued. This year the report has been replaced by a general review of the history and progress of the Bureau, with the object of making its aims better known and its services more extensively utilised throughout China. The establishment of the Bureau was authorised in June, 1918, by an order of the then Minister of the Interior, Ch'ien Neng Hsun, in an endeavour to follow the lead of the Western nations, and to prevent the recurrence of serious epidemics, such as that of pneumonic plague which swept the country in 1910 and again in 1917. The Bureau, which is directly under the Ministry of the Interior, is situated in the grounds of the Temple of Heaven. Its sphere of action has gradually increased until, in June, 1926, its four-fold functions were set out as follows: (*a*) research and teaching in connexion with the causes, prevention, and treatment of communicable diseases; (*b*) the examination and standardisation of materials pertaining to the prevention, disinfection, and treatment of these diseases; (*c*) the manufacture of vaccines, sera, and other therapeutic bacterial products; (*d*) the application of preventive measures against communicable diseases, and public health teaching and propaganda among the people. Distinguished Chinese and foreign specialists in preventive medicine and bacteriology are to be invited to act as advisers to the Bureau as occasion arises. The Bureau has already done useful work in cutting short epidemics of plague, cholera, typhoid, typhus, and small-pox in various parts of the country. During the war between the Kuominchun and the Fengtien factions in 1925–26, over 3000 wounded soldiers were segregated at the emergency hospitals at Nanyuan. Several medical officers from the Bureau went down to Nanyuan and gave tetanus antitoxin injections to 1352 wounded soldiers, most of the patients receiving 1500 units each. Of those immunised, not one

developed tetanus, while 30 out of 2000 men who were not injected died from the disease. This was the first time in China that extensive immunisation against tetanus has been given to the wounded. The administration of local public health measures has hitherto been almost entirely neglected in China. In May, 1925, the Bureau obtained permission from the Peking Metropolitan Police Department to establish a public health demonstration station in Peking. The type of work undertaken at this station includes a division of general sanitation; a division of public health medical services—e.g., infant welfare and industrial hygiene; a division of communicable diseases; and a division of vital statistics. Preventive inoculation against small-pox has been steadily growing, 4812 persons having been vaccinated by the Bureau last winter as against 27 in the year 1923. The importance of trustworthy vital statistics as a basis for national public health work is beginning to be recognised in China, although in the absence of a strong centralised Government the work is beset with difficulties.

AUTUMN SESSION OF THE DENTAL BOARD.

IN his address from the chair at the opening of the eleventh session of the Dental Board of the United Kingdom (the name has this week become an anachronism), Sir Francis Dyke Acland spoke of the important event in the dental world which had marked the period since he last addressed the Board—namely, the universal adoption of dental treatment as an "additional benefit" under the National Health Insurance Act, accompanied by a new scale and conditions of service. This, he said, would undoubtedly mark a very great advance towards the improvement of the health of our nation if the scheme was properly utilised. But in spite of the careful and admirable work of the Dental Benefit Joint Committee it would take time for the new system to settle down into good working order. The dental profession, he doubted not, would endeavour to work under the scheme with loyalty to it, and would even welcome the assistance of the regional dental officers in deciding questions which must need arise. But on occasions of this sort he could not help wishing that there were a higher standard of general education among a greater proportion of our people so that they might be more ready to utilise fully and properly the skilled services which are now at their disposal. Even if all the schemes of our education, health, and insurance authorities were to work as well in practice as they were meant to work on paper, their best efforts were liable to be undermined during the ages 14 to 16, between the times when the good habits of school days were apt to cease, and when employment within the sphere of Health Insurance began. "I believe," he said, "that the Board might usefully devote a considerable amount of its propaganda work to impressing upon juveniles at this very important period of their lives the importance of care for their teeth, and to explaining to insured persons, even more than we have hitherto done, the new duties and opportunities which the extension of dental benefit presents to them." In pursuance of this object the Dental Board decided to allot £4000 out of its available surplus of £31,100 to dental health education, along with any unspent balance from the previous year. The remainder was allotted thus: grants to students £21,000, grants for research £5000, post-registration lectures £600, and post-graduate lectures £500.

THE LATE DR. E. M. DE JONG.—On Nov. 15th Dr. Edward Meyer de Jong, died at Manchester in his sixty-sixth year. A son of Mr. Edward de Jong, the flautist, he was educated at London University and Owen's College, Manchester, qualifying in 1886. After a house appointment at Ancoats Hospital he took up general practice, and for some years had been medical officer of health for Lymm. He took the D.P.H. at Manchester in 1915. One of his sons, Dr. O. M. de Jong, was a pathologist in Manchester, and died a few years ago.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXCIX.

TREATMENT OF STRANGULATED HERNIA.

STRANGULATED hernia is a variety of intestinal obstruction, which, compared with other forms, has many favourable features. Cases are seen early, and accurate diagnosis is usually possible. The site of obstruction is known, and the part of the intestine involved can often be inferred; also, from the physical character of the swelling, it is possible to form an estimate of the condition of the strangulated loop.

Inguinal, femoral, and umbilical hernia provide the great bulk of strangulations, in that order of frequency. Proportionately, however, strangulation is commoner in femoral hernia. Strangulation, which implies an interference with blood-supply, is only liable to occur where the loop of intestine passes through an aperture with rigid walls. Such an aperture is present from the commencement in femoral hernia and in most umbilical herniæ. In inguinal hernia it is of secondary formation, the result of repeated attacks of inflammation, usually at the neck of the sac. Thus inguinal strangulation arises in an old-standing hernia, and can hardly escape observation. The same process may not be discovered if it occurs in a small umbilical or femoral hernia of recent development and completely hidden by subcutaneous fat. Where symptoms of intestinal obstruction are encountered, it is therefore important to search these regions with great care. Tenderness on deep pressure above the umbilicus or in Scarpa's triangle may give the clue, even where no lump is revealed by careful palpation.

Preliminary Treatment.

Once the diagnosis of strangulation has been made, immediate operation is called for. Only when a patient is first seen when already in a condition of extreme collapse is delay justified. This condition is due to the absorption of toxic bodies, not as yet identified, from the obstructed intestine. It is strictly comparable to that of chemical shock, such as has been produced experimentally in animals by the injection of histamine or by gross damage to the tissues. The essential feature of chemical shock is that the circulatory system is starved of fluid owing to a widespread dilatation of the capillary bed; another effect of the sluggish flow in dilated capillaries is a rapid loss of heat from the limbs and body-surface.

Warmth is required to combat stasis in the peripheral circulation; if an electric cradle is not available, a liberal supply of hot-water bottles, or of blankets heated at a fire and wrapped round the trunk and limbs will serve. An effective cradle may be extemporised by placing a stove under the bed, and draping blankets on each side so that the hot air is conducted to the patient. The foot of the bed should be raised 12 inches on blocks. Fluid must be administered by rectum, by subcutaneous infusion, or directly into a vein. Since in intestinal obstruction there is probably an alkalosis in the portal circulation, 3 drachms of ammonium chloride should be added to the saline solution given by the rectum. Where shock is really severe saline solutions are useless, and a pint of 6 per cent. gum solution should be given intravenously. Solutions of gum made from commercial preparations often contain highly toxic bodies, and only those which have been physiologically tested can be given without risk.*

The Anæsthetic.

Gas and oxygen is undoubtedly the safest method of general anæsthesia for administration to collapsed patients, and in such cases is very effective. Where

* Sterile solution of gum acacia ready for use can be obtained from Evans, Lescher and Webb, 50, Bartholomew-close, E.C. 1.

shock is already present spinal anæsthesia is inadmissible, owing to the rapid fall in blood pressure which may occur in the first 20 minutes after administration. However, local infiltration of the operation area with 0·75 per cent. novocaine combined with a nerve block of the ilio-inguinal and ilio-hypogastric nerves at the anterior superior spine is very effective for operations upon strangulated inguinal and femoral herniæ. Local infiltration alone works well in umbilical hernia, and is easy to carry out.

Operation.

No special incisions are required. The hernia is cut down upon, speed and hæmostasis being especially important. As the sac is distended with fluid, usually blood-stained, its identification is easy. The surrounding œdema often causes the separate coverings to stand out distinctly. The sac is opened immediately, the contents identified, and the condition of the strangulated loop inspected. The neck of the sac is then examined, and the healthy gut above and below the constriction is pulled down into the wound. Rarely it is necessary to incise the neck of the sac from within by a hernia bistoury, in order to release the constricting band. Such a procedure is difficult, and there is the double risk of wounding the gut and cutting an artery near the neck of the sac.

In an inguinal hernia division of the various layers nearly always releases the constriction; if not, the sac should be laid open in its length till the imprisoned loop is released. In an umbilical hernia the constricting ring can be cut freely outside the peritoneum. It is in femoral herniæ that difficulty is most commonly met with. The constricting element is not usually Gimbernat's ligament, as H. S. Souttar has pointed out, but a fibrous ring in the sac wall itself. Should it be impossible to pull the gut down with gentle traction, it is best to open the inguinal canal and divide Poupart's ligament, so that the neck of the sac can be freely laid open. Where there is a tight constriction and a probability that a portion of gut may have undergone pressure necrosis, this should be done at once. The attempt to pull such a loop either up into the abdomen or down into the sac in either case carries with it the risk of soiling the peritoneum with fæcal contents. The safe thing is to lay the doubtful gut bare and proceed according to what is found.

The loop of the gut when inspected is either obviously viable, obviously dead, or doubtful. When it is obviously viable, it is returned to the abdomen; when it is obviously dead, the gangrenous loop must be removed; the gut above and below may be joined end to end, or a tube may be tied into each portion, to drain away the intestinal contents, the continuity of the alimentary canal being restored by a second operation, usually 48 hours later. If the general condition of the patient is poor, and the condition of the bowel above the obstruction bad, drainage is to be preferred. If not, an entero-anastomosis should be carried out. The latter allows satisfactory repair of the hernia. Drainage implies healing by granulation, and the need for some form of permanent truss after recovery.

Where the gut is doubtful it is wrapped in a large abdominal swab wrung out in saline solution at 120° F. and left for five minutes, when it is nearly always possible to decide on the recuperative power of the wall.

Its consistency is of more importance than its colour or its lustre. If after the application of warmth and moisture it remains soft and flabby like wet blotting-paper, it will not survive. If death seems probable, resection should be carried out. A linear band of discoloration remaining where the constriction ring actually compressed the intestine and not involving its whole circumference, may, however, be infolded with a continuous stitch, and resection avoided. A patch graft of omentum may be sutured over the infolded line to insure against leakage in the event of necrosis.

If recovery seems likely, the loop may be returned to the abdomen, the hernial orifice repaired, and through a separate stab wound a small rubber tube led down to the doubtful loop. Such a portion of intestine will remain close to the hernial orifice, for it will not undergo peristalsis and the damaged surface will adhere to the neighbouring peritoneum. Should part of the wall give way in the ensuing week, the drainage-tube ensures that the general peritoneal cavity will not be infected, but that the contents will be led to the surface. As soon as the patient's condition justifies a further operation, the resulting fæcal fistula is closed by resection of the damaged portion.

Unless intestinal drainage has been necessary, the hernial aperture should be repaired and the wound closed with great care.

Post-operative Treatment and Prognosis.

While the operation is a local problem, the post-operative treatment is that for any form of intestinal obstruction. The form it shall take and the prognosis that can be offered depend entirely on the degree of toxæmia of the patient, and the amount of distension and of interference with the neuro-muscular mechanism of the wall of the gut. Should the obstruction be relieved by early operation after-treatment will usually give no anxiety. If toxic absorption has manifested itself, the measures outlined above should be prosecuted with vigour.

The intestinal wall requires the same treatment as any other weak or paralysed muscle. The principles are those employed in the re-education of a limb affected by poliomyelitis, modified to suit the case of a hollow muscular tube. They are, rest in a position of relaxation, the encouragement of nutrition, warmth, and avoidance of meddlesome stimulation.

Relaxation and rest are obtained by emptying as far as possible the distended proximal part of the alimentary canal and by withholding food and fluids by mouth, so that the weakened portion shall not be called upon to pass anything down, until decreasing distension and the passage of contents per rectum demonstrate that the contractile power has recovered. If much distension of the loop above the strangulation is present at the time of operation, its contents may be partially emptied either by puncture with a trocar, or, if resection is necessary, by passing a tube into the lumen. If the distension affects the upper part of the small intestine, a valvular jejunostomy is indicated. The stomach should be washed out both before and at the end of the operation in all cases showing intestinal distension. If fæcal vomiting has been present, a Ryle gastric tube may be passed down one of the nostrils into the stomach, and the gastric contents evacuated at short intervals by a Sprengel's pump.

As only sips of water may be given by mouth, fluids must be given plentifully by other means. Glucose should be added to fluids administered by the rectum or intravenously in the proportion of 6 per cent. Warmth, in the form of large fomentations of gamgee tissue applied at frequent intervals to the whole abdomen, is of real service.

Drugs.

Drugs are of very little value, and may be harmful. In strangulated hernia the practitioner is fortunate in having to deal with a healthy body, temporarily thrown out of gear.

We should help the intestinal wall in its efforts to propel contents along the lumen, but never try to make it do so. A series of gentle pushes may succeed where a vigorous kick only does harm. Aperients, one and all, act as irritants, and should never be given; they not only flog a muscle which is doing its best, but also cause an outpouring of fluid into the lumen. Irritants are already present in the form of toxic intestinal contents. Eserine applies an uncontrolled stimulus through the motor nerve to the muscle, and its use is therefore wrong in principle. A safer stimulant to peristalsis is the reflex one set up by the administration of a turpentine enema. Pituitrin acts directly on the muscle and is less harmful, but even so is better withheld, unless it is obvious that the natural powers of recovery are insufficient. Then it may be given in ½ c.cm. doses every two hours.

A valuable expedient is to run half a pint of liquid paraffin warmed to 100° F. down the stomach-tube, after washing out the stomach. This is entirely inert, and will neither stimulate an exhausted musculature to unavailing efforts, nor provide food for bacterial multiplication, but it has a marvellous power of finding its way along the canal, and re-establishing the normal passage of contents.

Taxis.

If a hernia is merely irreducible and there is neither tenderness in the swelling nor any sign of intestinal obstruction, taxis may be attempted. At a later period it is only justifiable if the condition of the patient or the absence of facilities make operation out of the question. When the swelling is dull to percussion any rough handling is dangerous.

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Special Articles.

THE RELATIVE INFLUENCE OF FOG AND LOW TEMPERATURE ON THE MORTALITY FROM RESPIRATORY DISEASE.

BY W. T. RUSSELL.

(*From the Statistical Department, National Institute for Medical Research.*)

IN a paper published in THE LANCET[1] I examined the influence of fog and temperature on the weekly mortality from respiratory disease among children and adults during the winter months, October to March, in the Metropolitan boroughs of Islington and St. Pancras over a period of 21 years, beginning at 1870. The analysis was made chiefly by graphical methods and the following conclusions arrived at.

1. That fog itself has no appreciable effect on the respiratory death-rate.

2. That if the prevalence of fog is associated with a low temperature and frost the respiratory death-rate of adults can be influenced very considerably, although no such effect is evident in the case of children.

Method of Partial Correlation.

When the foregoing was written, I had in mind the fact that the method of partial correlation would have carried the analysis a stage further and demonstrated which of the two variables, a fall in temperature or the presence of fog, exercised the greater influence on the respiratory mortality. I refrained from the application of this method at the time, however, as one of the variables, the amount of fog, could not be regarded, in a statistical sense, as forming a normal distribution. Since then Dr. Major Greenwood has suggested that, in the absence of a more suitable mathematical formula, the method of partial correlation would give an answer having at least some value as a first approximation and, in investigating the subject in this way, I am indebted to him for much valuable advice. I have calculated, in addition to the means of the three variables and the standard deviations of their distributions, the essential correlation coefficients and regression equations between the number of respiratory deaths among adults at ages 55 and upwards in the following week and (1) the mean temperature of the previous week, (2) the amount of fog in the previous week. A lag of one week in the deaths was allowed for in view of the fact that Dr. Greenwood, in an unpublished research to which he kindly gave me access, had found that the temperature was more highly correlated with the death-rate in the succeeding week than with that in the same week. Although the correlation coefficients were calculated for the corresponding week over the series of 21 years for each of the 26 weeks, comprising the period October to March, the tabular presentation and discussion are limited to the interval between the eleventh and nineteenth week, as the greatest prevalence of fog occurred, on the average, during this period. As regards the amount of fog, the assessment was made on a purely arbitrary basis. Where it was stated in the weather records that fog prevailed at 9 A.M. and at 9 P.M., and the explanatory note indicated that fog was present throughout the day, the amount of fog for that particular day was represented by 100. Fog in the morning and lasting until noon was standardised as 50, and so with intermediate amounts, due regard being given to duration and intensity. A series of comparative figures of the daily amount of fog were thus obtained. The totals for the days in each week were summed and the results taken as representing a quantitative statement of the weekly incidence of fog. Objection may possibly be raised to this system of measuring fog in order to ascertain if any association exists between its prevalence and an increase in the respiratory death-rate, as the effect of two successive foggy days might exercise a more deleterious effect on the respiratory organs than would the presence of fog on four successive half days, and yet the total amount of fog for the two weeks would be quantitatively the same. In the present case the data were not sufficient to consider periods shorter than a week. But a like criticism can be directed against the use of the mean temperature as officially published, the influence of two very cold days in any one week of otherwise high temperature can be overshadowed in the statement of the mean temperature for the week.

[1] THE LANCET, 1924, ii., 335.

The Results Examined.

The results now fall to be examined. During the period the eleventh to the nineteenth week of the 21 years there was no great variation in the average weekly temperature, as will be observed from Table I. The lowest mean temperature, 37·8° F., occurred in the fifteenth week, and the highest, 40°, in the nineteenth week. The standard deviations showed that the temperature distribution was much the same for each of the nine weeks as the values ranged from a minimum of 4·57° to a maximum of 6·27°. With the exception of a few weeks the mortality, like the temperature, was fairly constant. The greatest number of deaths occurred, on the average, in the nineteenth week, when there were 41 deaths. The next highest totals were 38 and 37 in the fourteenth and fifteenth weeks respectively. Apart from the nineteenth week, when the standard deviation reached 28·63 as compared with 16, the average for all the weeks, there was little dissimilarity in the distribution of the deaths. As regards the amount of fog, with the exception of the eleventh week over the series of years when the mean was 163, the other weeks seemed to be characterised by a general constancy in the average which centred round 80. But this similarity in the magnitude of the means must not be accepted as implying a like similarity in the distributions. There was a wide variation in the amount occurring in the particular weeks of certain years as the standard deviations of the distributions ranged from 66 to 135.

Having seen the manner in which the magnitude of the three factors varied, it was next of interest to study their interdependence as measured by the size of their correlation coefficients of the zero and first orders given in Table II. As was to be expected, the correlation coefficients between temperature and the number of respiratory deaths were negative in sign, and, in the present case, were all statistically significant, as they exceeded twice their standard errors. The highest coefficient of the zero order occurred in the thirteenth week of the 21 years, when the value was $-0{\cdot}806 \pm 0{\cdot}076$, and the two smallest $-0{\cdot}381 \pm 0{\cdot}187$ and $-0{\cdot}459 \pm 0{\cdot}172$ were found in the twelfth and nineteenth weeks respectively. The mean value of the coefficient for the series of nine weeks was in the neighbourhood of $-0{\cdot}54 \pm 0{\cdot}14$. The amount of fog and the number of deaths were positively correlated and in the eleventh week the value was $+0{\cdot}553 \pm 0{\cdot}151$, in the twelfth week $+0{\cdot}542 \pm 0{\cdot}151$, in the fourteenth week $+0{\cdot}777 \pm 0{\cdot}086$, in the eighteenth week $+0{\cdot}855 \pm 0{\cdot}059$, and in the nineteenth week $+0{\cdot}569 \pm 0{\cdot}086$. The correlation coefficient of $+0{\cdot}855 \pm 0{\cdot}059$ between the amount of fog in the eighteenth week and the respiratory deaths in the nineteenth week was remarkably high, and some of its importance was due to the size of one pair of coördinates—namely, the temperature and the amount of fog in the fourth week of 1880, which was the eighteenth week of the series as reckoned from the beginning of October of the previous year, and the respiratory deaths in the nineteenth week—i.e., the week ending Feb. 7th, 1880. In this instance the mean temperature was 28·9°, the amount of

TABLE I.

Showing the Means and Standard Deviations of (1) the Weekly Number of Respiratory Deaths among Adults Aged 55 Years and Upwards, (2) the Weekly Temperature, (3) the Amount of Fog, in Certain Weeks Measured from the Beginning of October over a Series of 21 Years from 1870.

No. of week.	No. of respiratory deaths.		Temperature.		Fog.	
	Mean.	Standard deviation.	Mean.	Standard deviation.	Mean.	Standard deviation.
11th.. ..	29 ± 3·3*	15·20 ± 2·35*	38·1 ± 1·0*	4·78 ± 0·74*	163 ± 29·4*	134·7 ± 20·8*
12th.. ..	30 ± 2·9	13·19 ± 2·03	38·1 ± 1·1	5·23 ± 0·81	70 ± 14·4	66·3 ± 10·2
13th.. ..	32 ± 2·9	13·39 ± 2·07	38·1 ± 1·4	6·27 ± 0·97	77 ± 22·4	102·8 ± 15·9
14th.. ..	38 ± 4·1	18·62 ± 2·87	38·9 ± 1·2	5·64 ± 0·87	80 ± 23·4	107·4 ± 16·6
15th.. ..	37 ± 4·0	18·54 ± 2·86	37·8 ± 1·3	6·01 ± 0·95	82 ± 24·3	111·2 ± 17·2
16th.. ..	34 ± 3·5	15·93 ± 2·46	38·4 ± 1·2	5·68 ± 0·88	80 ± 18·7	85·7 ± 13·2
17th.. ..	32 ± 2·6	11·88 ± 1·83	37·8 ± 1·0	4·57 ± 0·71	87 ± 24·5	112·4 ± 17·3
18th.. ..	34 ± 3·2	14·63 ± 2·26	39·8 ± 1·0	4·78 ± 0·74	70 ± 17·3	79·2 ± 12·2
19th.. ..	41 ± 6·2	28·63 ± 4·42	40·0 ± 1·1	4·93 ± 0·76	85 ± 21·7	99·4 ± 15·3
20th.. ..	30 ± 2·5	11·27 ± 1·74	—	—	—	—

* Standard errors.

TABLE II.

Showing the Correlation Coefficients of the Zero and First Orders between the Weekly Numbers of Respiratory Deaths and the Temperature and Amount of Fog of the Previous Week over a Series of 21 Years Beginning at 1870.

No. of week.	r_{12}	r_{13}	r_{23}	$r_{12\cdot3}$	$r_{13\cdot2}$
11th.. ..	− 0·687 ± 0·115	+ 0·553 ± 0·151	− 0·507 ± 0·162	− 0·566 ± 0·148	+ 0·327 ± 0·195
12th.. ..	− 0·381 ± 0·187	+ 0·542 ± 0·154	− 0·064 ± 0·217	− 0·413 ± 0·181	+ 0·561 ± 0·150
13th.. ..	− 0·806 ± 0·076	+ 0·211 ± 0·208	− 0·380 ± 0·187	− 0·803 ± 0·078	− 0·174 ± 0·212
14th.. ..	− 0·665 ± 0·122	+ 0·777 ± 0·086	− 0·643 ± 0·128	− 0·343 ± 0·193	+ 0·611 ± 0·137
15th.. ..	− 0·533 ± 0·156	+ 0·205 ± 0·209	− 0·128 ± 0·215	− 0·522 ± 0·159	+ 0·163 ± 0·212
16th.. ..	− 0·638 ± 0·129	+ 0·135 ± 0·214	− 0·089 ± 0·216	− 0·634 ± 0·130	+ 0·102 ± 0·216
17th.. ..	− 0·617 ± 0·135	+ 0·161 ± 0·213	− 0·022 ± 0·218	− 0·622 ± 0·134	+ 0·187 ± 0·211
18th.. ..	− 0·660 ± 0·123	+ 0·855 ± 0·059	− 0·500 ± 0·164	− 0·518 ± 0·160	+ 0·807 ± 0·076
19th.. ..	− 0·459 ± 0·172	+ 0·569 ± 0·148	− 0·460 ± 0·172	− 0·270 ± 0·202	+ 0·454 ± 0·173

1 = Number of deaths. 2 = Temperature. 3 = Amount of fog.

fog 345, and the number of respiratory deaths 156. This excessive mortality was real and was not due to any error of deferred registration of deaths as the weekly returns of the Registrar-General's Department for the week ending Feb. 7th, 1880, contained the following statements regarding the mortality for London generally.

"The annual death-rate from all causes which had been equal to 24·6, 27·1, and 31·3 in the three preceding weeks, further rose last week to 48·1 per 1000. The death-rate last week, under the influence of cold and fog, was higher than it has been in any week since the cholera epidemics of 1849, 1854, and 1866. The largest proportional excess of deaths last week occurred among persons aged upwards of 60 years. The deaths referred to diseases of the respiratory organs which had been 559 and 757 in the two preceding weeks, further rose to 1557 last week and exceeded the corrected weekly average by no less than 1118."

The importance of the high correlation in the week mentioned will be referred to later. The average coefficient between the number of deaths and the amount of fog for the nine weeks was $r = + 0{\cdot}434 \pm 0{\cdot}177$. When the partial correlation coefficients were calculated so as to exclude the influence of the one factor when the other was correlated with the number of deaths, the values were reduced in magnitude, but seven of the nine coefficients between the temperature and the deaths with the amount of fog constant remained sensible, and four in the case of the fog and the number of deaths with the temperature constant. It will be observed that in the thirteenth week, the sign of the partial coefficient between the amount of fog and the number of deaths became negative. An examination of the original weather records for this week over the series of 21 years revealed a curious anomaly, that in one instance the week ending Dec. 27th, 1879, the presence of fog and a low temperature produced no effect on the death-rate, as is indicated by the following statement of the daily records of temperature and fog in this week and the mortality of the succeeding weeks.

Record of Temperature, Fog, and Mortality for Week ending Dec. 27th, 1879.

Days in week ending Dec. 27th, 1879.	Mean temp.	Remarks.	Weeks ending—	No. of respiratory deaths.
21st	31·0	Sharp frost in morning. More or less fog all day.	Dec. 20th	41
22nd	29·2	Fog in the evening, very dense from 9 P.M.	,, 27th	46
23rd	34·9	Slight fog all day, thick fog at night.	Jan. 3rd	32
24th	31·9	—	,, 10th	21
25th	31·5	Dense fog clearing after 8 P.M.	—	—
26th	32·6	—	—	—
27th	30·0	—	—	—

In five of the series of nine weeks the partial correlation coefficients between the temperature and the number of deaths with the amount of fog constant were in excess of those between the amount of fog and the mortality with the temperature constant, and in the remaining instances the higher value was between the mortality and fogginess. When the average partial coefficient was calculated for the nine weeks over the series of the 21 years the value was $- 0{\cdot}533 \pm 0{\cdot}156$ when the amount of fog was constant and $+ 0{\cdot}324 \pm 0{\cdot}195$ when the effects of temperature were eliminated. The latter value does not exceed twice the size of its standard error and, therefore, cannot be considered as statistically significant. These results thus show that, although fog had a decided influence in some weeks, yet, on the average, a low temperature exercised the more dominant influence.

Accuracy of Prediction.

Having seen the degree of relationship that existed between the weather factors and the number of respiratory deaths, it now remained to be seen to what degree of accuracy the number of deaths in

any one week could be predicted if the temperature and the amount of fog in the previous week were known and what error was involved if the forecast was made from temperature alone. To find a solution to these problems, two regression equations were calculated for each week: (1) the one, a multiple regression, between the deaths on the one hand and the temperature and the amount of fog on the other; (2) the other, a simple regression, between the deaths and the temperature alone. By means of these equations, the numbers of weekly deaths were predicted from the amounts of fog and temperature and the percentage mean error between the theoretical and observed values were calculated. The results are given in Table III., where it will be seen that, in six

TABLE III.

Showing (a) the Multiple and (b) the Simple Regression Equations Connecting the Respiratory Deaths with the Temperature and the Amount of Fog, and the Percentage Mean Error that Results in Predicting the Respiratory Deaths from these Factors.

No. of week.	Equations.	Percentage mean error.
12th.. ..	(*a*) D = 83·2 − 1·511 T + 0·027 F	26·31
	(*b*) D = 102·3 − 1·898 T	26·15
13th.. ..	(*a*) D = 58·7 − 0·890 T + 0·105 F	25·89
	(*b*) D = 69·2 − 0·947 T	31·84
14th.. ..	(*a*) D = 135·6 − 2·522 T − 0·020 F	20·82
	(*b*) D = 129·4 − 2·396 T	21·71
15th.. ..	(*a*) D = 64·8 − 0·927 T + 0·103 F	24·23
	(*b*) D = 122·0 − 2·186 T	31·61
16th.. ..	(*a*) D = 84·0 − 1·366 T + 0·020 F	26·93
	(*b*) D = 87·5 − 1·416 T	29·75
17th.. ..	(*a*) D = 81·8 − 1·321 T + 0·011 F	22·50
	(*b*) D = 83·3 − 1·337 T	22·99
18th.. ..	(*a*) D = 106·6 − 1·965 T + 0·019 F	26·51
	(*b*) D = 108·7 − 1·975 T	26·64
19th.. ..	(*a*) D = 97·3 − 1·860 T + 0·253 F	25·44
	(*b*) D = 198·5 − 3·957 T	34·85
20th.. ..	(*a*) D = 48·4 − 0·571 T + 0·052 F	20·83
	(*b*) D = 72·0 − 1·049 T	21·64

D = Number of respiratory deaths.
T = Mean temperature. F = Amount of fog.

out of the series of nine weeks, the forecast based on the temperature alone was practically as good as that founded on the combined effect of temperature and fog as the percentage mean errors in both instances were almost identical. As might be expected, in the weeks in which the correlation coefficients between the amount of fog and the mortality exceeded those between the temperature and the deaths, the errors derived from the multiple regression were less than those resulting from the simple regression. The greatest difference occurred in the nineteenth week of the series of years in which the errors were 25·44 and 34·85 per cent. respectively. Reference has already been made to the fact that in London generally there was an exceptionally high respiratory mortality among the adults in the corresponding week in the year 1880, which the Registrar-General connected with the "low temperature and dense fogs." In the same week of that year in Islington and St. Pancras the respiratory deaths among adults numbered 156, the theoretical number deduced from the influence of temperature alone was 84, but when the combined effect of fog and temperature were taken into consideration the number of deaths was raised to 131. The impression conveyed by Table III., that even if the measure of fog and temperature in one week is known it is impossible to predict very accurately the number of deaths from respiratory disease in the following week, is, of course, correct. Thus in the series giving the least percentage error (that for the fourteenth week), on the average there is an error of the order of one-fifth of the average value and the individual discrepancies between observations and predictions are often large. For instance, in the year 1890 there were actually 86 deaths in the fourteenth week, the calculation from fog and temperature provides only 61; in 1886 there was also heavy mortality, 74; the calculation only postulates 51. But that this method of calculation is nearer the truth than if the effects of temperature and fog of the previous week are ignored may be easily proved. If there is an unknown series of numbers written on tickets and a person is asked to guess the number written on one ticket drawn at random, what shall he guess? If he knows nothing whatever about the numbers, any guess is as good as another and is a mere guess. In public health problems further particulars are usually available. If one is asked what is the most probable number of deaths in a particular week of the year, it would seem reasonable to say the average number of deaths in that week (corrected for changes of population) over a series of years, when the deaths dealt with are due to a cause not known to be increasing or diminishing. But if that system were adopted in the case just mentioned the estimate would be 38 deaths for both 1886 and 1890; the calculation gives 61 and 51 respectively and, although not good approximations to 86 and 74, are still very much nearer the true value than 38 and 38. In fact, as a little calculation, which it seems unnecessary to reproduce in full, shows, if a knowledge of the temperature and fog in the previous week is made use of, the average accuracy of the prediction is improved to the extent of 34 per cent of its measure of uncertainty, that under the most favourable circumstances predicting from the mean value would give an average percentage error not of 20 but of 30. For these reasons these regression equations have, I think, some little practical value. I should, however, strongly deprecate any suggestion that by their means it is possible sharply to distinguish the respective shares of fog and low temperature in the genesis of mortality.

Conclusion.

It is essential to bear in mind that, in any study of the influence of weather on the prevalence of disease, the assignment of the increased mortality to any particular factor is not nearly so simple as is generally believed. The fact, often overlooked, is that there are a multiplicity of causes, both atmospheric and meteorological, all of which are highly inter-related, and it is the cumulative effect of these, and not the influence of an individual factor that finds expression in an increased death-rate from respiratory disease. The same point is strongly emphasised by Sir George Newman in the annual report of the Ministry of Health for 1925, p. 27, in the following sentence:—

"The true inference is, I believe, that in the matter of atmospheric pollution, as in that of meteorological factors, the inter-related variables in any given case are so numerous that only by means of a far longer series of observations than our data provide can any valuable statistical conclusions be reached."

As regards the importance of the two factors examined, temperature and the amount of fog, so far as the present data are concerned, it seems warrantable to conclude:—

1. That although the number of respiratory deaths in the following week was more highly correlated with the fogginess than with the temperature of the previous week over certain periods, yet, on the average, a low temperature exercised the greater influence.

2. That knowing the temperature and the amount of fog, it is possible to predict the mortality of the succeeding week, but only within a marginal error of roughly 30 per cent.

THE LATE Dr. H. D. CROOK.—Dr. Herbert David Crook, who died suddenly on Nov. 15th at the age of 70, received his medical education at Bristol and Leeds, and qualified as M.R.C.S. in 1877. He served as surgeon-major in the Turkish Army during the Russo-Turkish War of 1877–78, and became medical officer in Constantinople; soon afterwards he acted as surgeon to the Field Force in Griqualand, South Africa. In 1901 Dr. Crook settled in Kimberley, but later left for Canada where he interested himself in farming. Five years ago he went to Irchester, Northamptonshire, and took up the practice in which he was engaged at the time of his death. He leaves a widow, two daughters, and a son.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE annual meeting of Fellows and Members of the College was held on Thursday, Nov. 18th, at the College in Lincoln's Inn-fields, Sir BERKELEY MOYNIHAN, the new President, in the chair.

The report of the Council stated that during the past year a deputation had been received from the Association of Members urging that in the petition of the College for a new Supplementary Charter, which was granted in August last, there should be included a clause securing for Members representation on the Council. Such a clause, according to the report, was not included because of its controversial nature.

The PRESIDENT explained the significance of the new Supplementary Charter, which gave the Council power to alter by-laws in accordance with a long and careful method of procedure; certain by-laws, he said, had already passed the stages of revision, the intention being that they would come into force early next year. Only once, he added, had the annual addition to the number of Members been larger than it was during the year under consideration, when the figure 768 was reached.

Mr. H. WANSEY BAYLY moved a resolution that this meeting should reaffirm the justice of admitting Members to representation upon the Council, and should urge the Council to submit the matter to a postal vote of Fellows and Members. Dr. REDMOND ROCHE seconded the motion, pointing out that it was sought in this way to remedy the injustice to the general constituency of the College brought about by the Charter of 1843, which vested the government of the College in the Fellows. The resolution was carried by a large majority.

CRIPPLED AND INVALID CHILDREN.

LONDON CONFERENCE, NOV. 18TH–19TH, 1926.

A CONFERENCE on the Care of Crippled and Invalid Children, arranged by the Invalid Children's Aid Association and the Central Committee for the Care of Cripples was held in the Great Hall of the British Medical Association on Nov. 18th and 19th. The chairmen at the four sessions were Lord Islington, the Duchess of Atholl, Sir Arthur Stanley, and Sir Robert Jones, and the opening address was delivered by Lord Eustace Percy in the absence of the Minister of Health, who was engaged, as Mrs. Neville Chamberlain explained, in presiding over the Standing Committee dealing with a Bill on smoke abatement.

A Survey of Work in Progress.

Mr. R. C. ELMSLIE reminded the audience that the prevention of crippling conditions was not easy. Much more knowledge was needed of infantile paralysis —now the greatest cause of crippling—before it could be prevented. Tuberculosis was diminishing and did yield to adequate social improvement, but the exposure of the child to infection from parents and others could only be got over gradually by preventive measures and education. Provision for the treatment of rickets would be needed for many years; the congenital causes of crippling in this country were at present unpreventable.

Sir ROBERT JONES said there was great ignorance of the causes of tuberculosis and rickets. Parents did not know that every tuberculous child had become infected by the ingestion of the bacillus either from milk or by direct contact with a human consumptive, and they generally looked upon rickets as a hereditary scourge from which there was no escape. The essential duties of the C.C.C.C. were medical rather than educational, and they must aim at cutting off the supply of cripples at the source. There were very few facilities for cripples over school age; some of the dismantled Poor-law infirmaries might be equipped to deal with these patients.

Dr. R. VEITCH CLARK said that, as M.O.H. of Manchester, he received about 500 notifications each year of new cases of tuberculosis in children under 15 years of age, of which at least half were non-pulmonary. A milk-supply 10 per cent. of which was tuberculous was a scandal. The relation between catarrhal conditions and rickets was not realised, nor was the importance of fresh air and sunlight in combating it understood. Inadequate diet was a corollary of poverty and would always be with us to some extent, but the abolition of atmospheric pollution was within our power and, if carried out, would, he believed, practically eliminate rickets.

The Preventive Side.

Papers on Rickets, Rheumatism, Chorea and Heart Disease, and Tuberculosis were read respectively by Dr. Stuart J. Cowell, Dr. Arbour Stevens, and Dame Agnes Hunt.

Dr. COWELL said that rickets was commonly thought of as a disease of children's bones, producing lameness. Actually, however, it caused also disturbance in the general processes of the body, and was responsible for teeth that developed late, for flabby muscles, reduced resistance to disease, and a disposition to languor and apathy. The antirachitic vitamin (D) could be manufactured by exposure to ultra-violet light, and many foods—milk, fats, oils, and vegetables which contained little or none of the vitamin—could be rendered powerfully antirachitic by exposure to ultra-violet rays. Rickets could be prevented either by an adequate supply of vitamin D in the food or by exposing the body to ultra-violet light. A mother could hand on her supply to her developing offspring both before birth and during lactation. A widespread use of cod-liver oil by mothers would do a great deal to reduce rickets, and small doses of a quarter of a teaspoonful twice a day could safely be given to an infant of a few days' old. Cow's milk varied in vitamin capacity, the pasture-fed summer cow giving milk with a high antirachitic vitamin content, and the stall-fed winter cow practically none. It might be feasible to give the cows ultra-violet light treatment in winter. To prevent the crippling effects of rickets we must rely on early treatment, and it should be remembered that nature would work wonders if given the opportunity. The assertion that rickets was now rare in London was hardly borne out by recent statistics, and it was still rampant in industrial centres.

Dr. STEVENS pleaded for the treatment of cardiac cripples alongside orthopædic cripples. They needed the same things—early treatment, more hospital beds, specialists to treat them, prolonged stay in hospital, and intelligent after-care. There were some 80,000 to 100,000 cardiac cripples in the country, for whom little was being done. Heart disease in children was increasing, these cases now outnumbering those suffering from tuberculosis. Views varied greatly as to the cause of heart disease. Poverty was recognised as a predisposing, though not as a primary cause, but Dr. Stevens considered that the poor, who could not afford proper nourishment or good housing conditions, were the greatest victims, and that malnutrition was the chief predisposing cause. There was a definitely acid type of child, whose diet was lacking in such articles as milk, eggs, and cheese, and an enormous proportion of heart disease cases occurred among this group of children.

Dame AGNES HUNT thought it extremely difficult to prevent tuberculosis because it took so long to manifest itself. A consumptive mother might suckle her new-born infant, kiss it, and sleep with it, and it was almost impossible to take preventive measures with a baby of 4 or 5 months old. In any case, it was not fair to place the burden of prevention on a sick and overworked mother. Trouble should be taken to spread a knowledge of the laws of health, and to combat ignorance, vice, and dirt.

"Unity of Effort."

Dr. C. E. TANGYE gave an outline of the orthopædic scheme in Wiltshire, linked up with that for Bath and the county of Somerset. The scheme was run by a

purely voluntary committee, but the county council was its backbone as far as finance was concerned. Coöperation from general practitioners was an essential part of the scheme, and doctors were beginning to refer their patients from the earliest stages. The spectacular appeal would gradually disappear as prevention became more and more the aim of all orthopædic schemes. Dr. Tangye blamed old-fashioned desks and forms in schools for many postural deformities, and said that the provision of furniture which did not manufacture crooked spines should be considered an elementary duty of any local education authority.

Mr. G. R. GIRDLESTONE spoke on the part of voluntary effort in an orthopædic scheme, and made out a strong case for the voluntary hospital and for a scheme worked out on a voluntary basis. One great objection to a purely official hospital dealing with cripples was the age limit. In a hospital run by a local authority no treatment could be given to any of these patients over school age except those suffering from tuberculosis. Many victims of infantile paralysis and of accidents, and others were thus unprovided for, and no system should be accepted which excluded them. A hospital could not be run entirely on a voluntary basis without financial help from the local authority, but he preferred the partly voluntary type and a staff that was honorary or paid on a part-time basis. Members of such a staff often held special orthopædic appointments, and this encouraged coöperation between special and general hospitals. Patients came to a voluntary hospital or clinic through all sorts of channels, official and private. If the clinic was run by a voluntary committee it soon became widely known locally, and cases tended to come at an earlier stage. Where local authorities tried to run clinics with their own personnel, without the help of skilled and semi-skilled volunteers, the staff got grossly overworked.

Dr. W. G. SAVAGE explained what he considered a more excellent way. In Somerset the orthopædic scheme was administered by the county council, use being made of the voluntary hospitals. Instead of waiting till public sympathy was aroused to start a clinic, this was done by a stroke of the pen, the clinics being run by the county council in its own premises. Voluntary help was taken advantage of, but it was under the control of the local authority. By this arrangement there was better selection of cases. He did not think the age limit a disadvantage. When resources were restricted it was necessary to be a little hard-hearted, and to concentrate on the cases likely to give the best results. Unless prevention was in the forefront it was not worth carrying on a scheme at all. The curative side was in the very bones of the staff of a voluntary hospital, and they were not accustomed to doing preventive work.

Mr. GIRDLESTONE said, in reply, that time would prove which method was the best, and that method would be adopted, but different systems might apply in different areas. He would remind Dr. Savage that any orthopædic scheme existed only because up to the present prevention had not been successful. Official channels were just as ready to pass children quickly to the clinics whether the clinics were official or voluntary in origin. The real economy was to secure early diagnosis and treatment, and voluntary hospitals did take an interest in preventive work.

Dr. W. B. KNOBEL said that London had a complete scheme for children suffering from tuberculosis, and no child recommended for residential treatment was ever kept waiting. But they could not get the cases early. Children were sent to hospital schools after they had been attending for weeks, months, or even years, at out-patient departments. Nobody could really think it better for a child with a tuberculous hip or spine to be treated at an out-patient department than in a country institution. There was said to be a shortage of beds for infantile paralysis. But there were plenty of beds in the fever hospitals of the M.A.B. for cases in the first stage, and the 50 beds at Carshalton for the second stage were never full. He pleaded with orthopædic surgeons to place children in the best conditions at the earliest moment.

Sir ARTHUR STANLEY expressed some disappointment that the hopeful signs of a scrap between Mr. Girdleston and Dr. Savage had petered out so amicably. Personally he thought the best plan was an official scheme supplemented by voluntary effort.

Education of the Cripple.

At the final session of the Conference the education of the physically defective child was discussed from the point of view of the surgeon (Mr. K. J. Acton-Davis), of the school manager (Mrs. Salmond), of the matron (Miss Hughes), and of the teacher (Miss James). Sir Montagu Burrows dealt with the subject of the physically defective child after school, and there was some useful discussion on the vocational training and placing of cripples in employment.

THE MECHANISM AND INCIDENCE OF INDUSTRIAL LEAD POISONING.

IT is important to realise that the chief danger in any lead trade results from inhalation of dust or fumes; thus the painter using ready-mixed paint incurs only the very slight danger of ingesting small amounts of lead—e.g., from his paint-smeared fingers. As soon, however, as he uses sandpaper on painted surfaces by any *dry* process, he begins to inhale large amounts of lead dust and he inhales oxides of lead when he burns paint from a painted surface with a blow-pipe. Animal experiments (T. Oliver, 1914, and J. C. Aub, 1924) have demonstrated that *inhalation* of small amounts of insoluble lead compounds is much more dangerous than *ingestion* of very large amounts.

Work in Germany (Gusserow, 1861, Heubel, 1871) and in U.S.A. (Aub, 1924) has shown that inhaled and ingested lead compounds are stored as an insoluble phosphate in the skeleton. This may be gradually mobilised and excreted in the ordinary course of metabolism, or by the ingestion of acids; in passing through the blood-stream it produces toxic symptoms. Detailed analyses of human tissues have shown that workers in dusty lead trades may have from 0·5 to 1 g. of lead phosphate in the skeleton.

Susceptibility of Women.

In a discussion whether women are more susceptible to lead poisoning than men, Alice Hamilton (Harvard), in her book "Industrial Poisons in the United States," quotes the following facts:—

The White Lead Works, Newcastle-on-Tyne, in 1897 employed 328 men and 571 women. During six months of that year 19 men were reported as having lead poisoning, a rate of onef or every 17 employed; and 66 women or one for every eight to nine employed—i.e., the rate was just double (Oliver).

The report of the Factory Inspection Department for 1910 showed that in the Staffordshire potteries there was twice as high a rate of plumbism among women dippers as among men dippers.

Newman, McConnell, Spencer, and Phillips, of the United States Health Service in 1921 examined 1436 men and 373 women (Occurrence of Lead Poisoning in the Pottery Trades of New Jersey, Pennsylvania and Ohio). Although the men were far more exposed to lead in this trade than women, there was more plumbism among the women than among the men. The average length of exposure of the "positive" male cases was 17 years, and the female cases 9·3 years.

It appears that the female reaches certain stages of lead poisoning in about half the time required for the male to reach them. In one series, comparing the men and women who work side by side in the dipping rooms, it was found that 58 male ware-carriers had no positive cases of plumbism, whilst 62 women doing the same work had a rate of 4·8 per cent. Among 71 male dippers' helpers the rate of plumbism was 8·4 per cent., and among 149 female dippers' helpers the rate was 14·4 per cent. In one series of

Hamilton's, however, and in another observation of Prendergast's and in another of E. Collis's, there was no numerical difference between the incidence in men and that in women.

E. L. Collis and M. Greenwood ("The Health of the Industrial Worker," 1921) sum up the subject as follows:—

> The statement is not infrequently made in relation to lead poisoning that females exhibit a sexual proclivity to plumbism. We hold that the effects of plumbism in causing miscarriage and still-birth is a sufficient reason for excluding females from exposure to lead dust, but we do not feel satisfied that there is evidence that they fall victims more readily than men. When women (who by long employment had become more or less acclimatised, more or less immune to the influence of lead) were quite wisely prohibited from work in white lead beds in 1897, and their place was taken by non-acclimatised men, a great rise in cases of plumbism occurred affecting the men. Later, as the causation—the inhalation of lead dust—became more fully recognised and guarded against, the case-incidence fell almost to vanishing point. When, 20 years later, during the war, owing to the scarcity of male labour, the employment of women at this work was again permitted temporarily and non-acclimatised women took the place of acclimatised men, no rise in the case-incidence occurred. It was confidenly expected that a rise would occur because the new workers were non-acclimatised, and not because they were women; and the absence of any significant rise was at once attributed to the efficacy of the precautionary measures now adopted and to the resistant powers of woman. On the completion of the war the men resumed their old work; during the period of war service they had lost their acquired immunity; more cases of poisoning were now reported among the men than occurred when the women took over the work. The existence of greater activity in the industry in the post-war period must be remembered when considering this evidence; but after due allowance has been made it supports the view that women are not more susceptible to lead poisoning than men. We are unaware of any scientific evidence in support of the alleged sexual proclivity and regret that a case, sound in itself, should be supported by unsound arguments.

Thus, in weighing the figures quoted it is necessary to take the economic factor into consideration, for, apparently, when men and women were under equally unfavourable economic conditions the incidence was the same. It may be argued that the older figures show a greater incidence amongst women, because of the inferior economic conditions under which they had to exist. The average exposure of the women, however, is much less (see figures of United States Public Health Service by Newman and others quoted above).

Damaging Effects in Women.

Lead seems to do more harm to women than to men. They succumb in shorter period (Hamilton, quoted above). They also get more severe forms of poisoning, especially convulsons and blindness. Prendergast, 1910, in the Potteries, found the following:—

640 Cases.

	Men.	Women.
	%	%
Colic	77·6	69.1
Paralysis	57·0	30·0
Lead convulsions	15·0	34·9
Total blindness	2·3	7·7
Partial blindness	3·5	10·2

Hamilton discovered the greater liability of women to lead encephalopathy in the United States pottery industry. In 1911 there were 1100 men employed in lead processes in the potteries and 87 cases of lead poisoning had occurred among them during that year—a rate of about 8 per cent. During the same year there were 57 cases among the 393 women employed—a rate of 14 per cent. The proportion of encephalopathy in the male cases was only 1 in 17; in the female cases it was 1 in 4·5. These figures, of course, refer to white lead dust, but all authorities are agreed that the painting trade is a frequent source of the worst forms of lead poisoning.

Oliver states that the maximum age-incidence occurs at an earlier age in women (18–23) than in men. Further, this is the age when they would be employed in painting. Oliver further says that while females rapidly break down in health under the influence of lead, men can work a longer time in the factory without suffering, their resistance apparently being greater.

Reproduction.

The work of the Harvard group (Aub and collaborators, 1922–1926) shows that lead absorbed is stored in the bones and may at any future time become free in the circulation. Women exposed to lead before marriage, therefore, run the risk, when married, that, even though they are now removed from exposure, they may have miscarriages and dead babies because lead can be liberated from the bones and destroy the ovum or fœtus. Reid gives the following figures:—

100 Mothers.

Occupation.	Miscarriages and stillbirths.	Deaths under one year per 1000 born.
Housework	43·2	150
Mill work, not lead	47·6	214
Lead work before marriage	86·0	157
Lead work after marriage	135·5	271

This table shows that mill work after marriage, even without exposure to lead, results in a high rate of infant mortality; but lead work before marriage increases the abortion-rate. Lead work after marriage shows both these effects to an exaggerated degree.

Dineufbourg wrote a thesis in 1905 on the effects of parental plumbism. He divided the cases into three groups: (1) Women married to lead workers, but themselves free from lead; (2) women who had been exposed, but married men free from lead; (3) women who had been exposed who married exposed men.

—	Pregnancies.	Abortion.	Stillborn.	Per cent.	Born living.	Percentage of living surviving first year.
Fathers leaded	442	66	47	25·5	329	74·4
Mothers leaded	134	17	6	17·0	111	73·9
Both parents leaded	23	4	4	35·0	15	66·6

It is, of course, in the third group that the effect of the lead is most striking. If the two other groups are compared, paternal plumbism seems to be as disastrous as maternal plumbism, and, indeed, the abortion-rate is actually higher; but the second and third groups are too small to be taken very seriously. A. Pinard quotes a case of a woman, married to a lead-poisoned man, who was pregnant five times and always prematurely delivered of a dead child and who then bore to a healthy man a perfectly normal child.

Cole, of Wisconsin, and Weller, of Michigan, fed commercial white lead in capsules to guinea-pigs with the following results:—

—	Free female mated with:	
	Free male.	Lead male.
Number of offspring	58·0	65·0
Average birth-weight, grams.	81·5	66·3
Number still-born	3·0	3·0
Died first week	2·0	9·0

RHEUMATISM AND HEART DISEASE IN CHILDREN.—An anonymous lady has given £12,000 to the Children's Home Hospital, Strathblane, Stirlingshire, to equip and partially endow a home for children recovering from rheumatism and resultant affections of the heart. The home will be the first of its kind in Scotland, and Dr. Leonard Findlay is to be consulting physician.

TUBERCULOSIS WEEK-END CONFERENCE.

LONDON, NOV. 19TH–22ND, 1926.

THE first meeting of a Conference arranged by the Tuberculosis Society and the Superintendents of Tuberculosis Institutions was held at the House of the Royal Society of Medicine on Friday, Nov. 19th, under the chairmanship of Dr. JAMES WATT, when Dr. O. STRANDBERG, of the Finsen Institute, Copenhagen, read a paper on

Heliotherapy and Artificial Sunlight

in the Treatment of Tuberculosis, and particularly Tuberculosis of the Larynx. Speaking in fluent English, Dr. Strandberg stated that the midday sun in the southern Alps and lowlands and in Switzerland contained the healing rays in their most active form, and that a lamp for the production of these rays should, like the sun, show a continuous spectrum, and possess the greatest number of blue, violet, and ultra-violet and also luminous heat-rays. It is, he said, only the carbon arc lamp that gives a continuous spectrum, whereas all other lamps show a line spectrum —i.e., luminous lines broken by dark intervals. At the Finsen Institute two types of carbon lamp are used—one large, using 75 amps. at 55 volts, the other small, using 20 amps. at 55 volts. Seventy-five amps. is the highest practicable current that can be utilised to give with 55 volts a powerful, chemically active, and quietly burning light. The upper carbon of the 75 amp. lamp should be the larger and thicker (300 × 31 mm.) and attached to the positive pole. The lower carbon should measure 300 × 22 mm. and be attached to the negative pole. Corresponding measurements for the smaller lamp should be: upper carbon 300 × 12 mm., lower carbon 300 × 8 mm. The lecturer showed many of the various types of lamps on the screen, and detailed his objections to their use mainly on the grounds that their voltage was too high or their ampèrage too low, as well as on the ground that several of them give a broken spectrum. He then described how the apparatus should be installed and applied, with the necessary precautions to take. The lamps should not be allowed to swing, but slide up and down on their guide-rods; draughts should be minimised not only in the interest of the patient, but to keep the lamp as steady as possible; the walls should be distempered in a dark colour to avoid the discomfort of reflected heat-rays and the carbons should be so adjusted as to throw a cone of light upon the patient. Two large lamps will suffice for eight patients, sitting astride upon chairs, any unequal distribution of the total light being compensated by occasional exchange of position.

The duration of exposure will depend, said Dr. Strandberg, on the local reactions, blisters, erythema, &c., and the general condition of the patient. Thus, patients with lung disease should have 10 to 15 minutes' exposure to begin with, and those without lung complications may have 25 to 30 minutes' exposure from the first. Children, of course, should have shorter exposures; afterwards a tepid shower bath is useful. Severe heart disease, arterio-sclerosis, and nephritis of non-tuberculous origin are contra-indications to this form of treatment. Slight rises of temperature (100°–101°F. per rectum) are not a contra-indication, but where the temperature exceeds 102° the baths should be stopped for a day or two, and then, beginning with reduced exposures, gradually increased. Hæmoptysis, in Dr. Strandberg's opinion and experience, is not a contra-indication. Out of 147 patients treated, only 2 had hæmoptysis who never had it before. Light treatment of tuberculous laryngitis should be combined with local treatment, the galvano-cautery, excision, &c., and local treatment should begin when the patient's temperature has nearly fallen to normal and his general condition has improved, since the whole object of the light baths is to alter the biological immunity reaction. The treatment should be continued for four to six weeks after all signs have disappeared. Combined pulmonary and laryngeal cases should be treated with small doses. Deflected sunlight treatment of the larynx is useless because only a small amount of the light can be utilised; it is impossible or difficult to light up the affected spots, and the chemical components of the light are absorbed by the mirrors. Pictures of various methods of local application of light to the larynx were shown, amongst them, Cemach's with Kromayer mercury-vapour lamp, and Wessely's, which, after cocainisation, utilises Killian's suspension method or Seiffert's autoscope. However good the results of such treatment may be they cannot be due to local effects. Probably they are the result of a more or less total exposure assisted by the faucial illumination.

Turning to figures, Dr. Strandberg said that he has had 41 cases of *aural tuberculosis* treated by operation and by light. Of these, 9 are not yet completely dry, 1 died of phthisis, and in 23 cases a radical operation was rendered unnecessary. Sixty cases of *pulmonary tuberculosis* have been treated by Ostenfeldt at the Finsen Institute with the following results: Of 16 cases in Turban stage 1, 7 improved and 9 remained stationary. Of 17 in stage 2, 6 improved, 7 remained stationary, and 4 became worse. Of 25 in stage 3, 5 improved, 13 remained stationary, and 7 became worse. These figures seem to offer a strong argument in favour of light treatment in pulmonary tuberculosis, and still better results might be anticipated if it were to be carried out in a sanatorium. There were 203 cases of *tuberculosis of the larynx* submitted to light treatment. Of these, 11 still remain under treatment, 10 have improved, and 79, for one reason or another, have discontinued treatment. Of the 79, 45 improved, 13 remained unchanged, 9 became worse, and 12 died. Of the 113 cures, 77 were cases of purely intrinsic disease, 37 were both intrinsic and extrinsic, and 2 were extrinsic. These results confirm Sir StClair Thomson's dictum that the greater danger lies in cases of extrinsic tuberculosis.

The lecturer showed at the conclusion some coloured slides of laryngeal disease with the results of treatment.

Discussion.

Discussion was opened by Sir STCLAIR THOMSON, who paid a warm tribute to the work done by Dr. Strandberg at the Finsen Institute in Copenhagen. England, he said, was notoriously a slow starter, and after two years of agitation Midhurst had only now fitted a complete light installation. This method of treatment offered more chances of cure, but one should not forget that sanatorium treatment alone sometimes does a great deal of good, and at least as much as ever tuberculin did. Dr. Strandberg was to be congratulated on his results, and also on his frankness in publishing them. The Midhurst installation had been made in Copenhagen, and had been put in charge of a Danish nurse, so they had done everything to bring it up to date.

Mr. SOMERVILLE HASTINGS had visited Leysin and seen the sunlight treatment in operation there, and was convinced of its efficacy, since he was not struck by either their surgical or hygienic methods, and the good results must, therefore, have been due to the sun. As regards Wessely's treatment, which he had seen at Vienna, he said it had impressed him greatly because of the great relief it afforded to the pain on swallowing and other unpleasant complications of tuberculous laryngitis. His experience of light treatment in cases of lupus of the nasal passages, pharynx, and larynx was unfavourable, and the results were not so good as with the cautery.

Dr. A. EIDENOW gave the results of his researches, along with Dr. Leonard Hill, and others, into the employment of lamps of various types. He said that there is no arc which gives a continuous spectrum,

the spectrum of the carbon arc becoming interrupted in the lowest wave-lengths. Only the lower wave-lengths produce erythema and erythema is the important factor, since it can raise the hæmobactericidal power of the skin. Those who suffer from chronic tuberculosis have a very low blood resistance—i.e., a low hæmobactericidal power. Hence the necessity for very careful dosage. Excessive dosage, whether by arc or Hg vapour, lowers the bactericidal power of the blood, and makes the patient worse, and in animals will hasten death. There is, too, a definite optimum area of skin to be irradiated so as to have the most favourable influence on the bactericidal power of the blood—in the case of the rabbit, 20–24 sq. cm. In the matter of technique, then, a comparatively small area of the body (about one-fourth) should be irradiated with the production of a limited erythema, and the time to undertake local treatment is when the blood resistance is high. He congratulated Dr. Strandberg on his good results in a series of cases far more numerous than his own.

Sir JAMES DUNDAS-GRANT dealt with his experience of the Wessely treatment and the application of the so-called cosine law, that the intensity of light is proportional to the cosine of the angle of incidence.

Dr. STRANDBERG, in reply, reiterated his objections to Wessely's theory, that it is not really local treatment, and that quite as good results could be more easily obtained by placing the patient on a couch and giving him a total light bath.

Dr. WATT, in conveying the thanks of the meeting to Dr. Strandberg, paid tribute to his pioneer work in the treatment of tuberculosis by light.

On Saturday, Nov. 20th, there were excursions to various sanatoriums—Midhurst, Frimley, and King George V.—and the medical superintendents of these institutions acted as hosts.

On Monday, Nov. 22nd, a large number of visitors attended demonstrations at the Brompton Hospital by Dr. L. S. BURRELL, who exhibited amongst other objects of interest a compressed air chamber to hold five people, the value of which, according to Dr. Burrell, lies in the breathing of oxygen by patients in the chamber. He also showed a room in which several patients were seated round a steaming cauldron of creosote. The bronchi of a patient were then injected with a solution of lipiodol to discover a bronchiectatic cavity; the skin over the small space between the cricoid and thyroid cartilages was cocainised, and then an intratracheal injection of novocaine was given followed by a few c.cm. of lipiodol; very shortly afterwards the X ray of the lung was on view. Dr. Burrell also did a refill in a case of artificial pneumothorax and so concluded a demonstration of unusual interest and variety.

At 3 P.M., in the House of the Royal Society of Medicine, under the presidency of Dr. F. RUFENACHT WALTERS, Dr. P. F. ARMAND-DELILLE, of Paris, delivered an address on the

Diagnosis of Bronchiectasis and Lung Cavities by Intratracheal Injections of Lipiodol.

In cases, he said, where cavity was suspected but where tubercle bacilli were not present in the sputum and the X ray picture was not satisfactory, intratracheal injections of lipiodol made it possible to determine with absolute exactitude the topography of a cavity, and whether there was one or more. The procedure, due in the first instance to Sicard and Forestier, was, in his opinion, specially suitable for children. It could be adopted wherever the stethoscope gave evidence of a cavity without making it possible to say definitely that it was present. It was not a necessary procedure in cases of pulmonary tuberculosis when the sputum was found to contain tubercle bacilli, and at X ray examination the cavity was portrayed characteristically with a light centre and dark, defined circumference. Cavernous breath sounds and whispering pectoriloquy in the lower part of a lung might indicate either a cavity or a pleurisy, or a fibrosis (sclerosis) following a basal pneumonia with dilatation of the bronchi in some cases. Where there was partial pleurisy with a little pus it was important to know what connexion there might be between a basal cavity and other parts of the lung because of the possibility of operation. In such cases lipiodol was useful. Lipiodol was a strong solution of iodised oil warmed to blood heat (106° F.); 15–20 c.cm. were injected by means of a specially designed curved needle and trocar into the space between the cricoid and thyroid cartilages after cocainisation. By leaving the cannula in position a further 15–20 c.cm. could be injected if necessary.

In his own cases—60 in number, said Dr. Armand-Delille, only one, a girl of 15, had suffered from temporary dyspnœa; no other accident had followed, and there had never been any manifestation of iodism. The most useful application of the method was in cases of bronchiectasis. The disease showed very characteristic symptoms—long-continued cough, sputum, circulatory and trophic troubles, and physical signs in the middle and lower part of the lung. In such a case the X ray showed nothing but an irregular shadow, whereas with lipiodol dark spots, oval or round and of the size of a pea to a nut, were seen confluent with or adjacent to the bronchi. There were various types of dilatation: (1) Doigt de gant, or finger-glove; (2) cylindrical; (3) fusiform (common in children who had had whooping-cough or broncho-pneumonia); (4) ampullary; and (5) sclerosis with signs of irregular dilatation of the bronchi. The usefulness of the lipiodol method of diagnosis was not confined to such cases. It could also be used to show up cysts communicating with a bronchus, or an abscess which had penetrated upwards through the diaphragm. Finally, said Dr. Armand-Delille, the method had some therapeutic value, its repetition being sometimes followed by improvement in the patient's condition, such as lessening of cough and sputum.

Discussion.

Dr. F. G. CHANDLER considered the intratracheal injection of lipiodol a method of precision in the diagnosis of bronchiectasis, and stated that he had used it in 50 cases at Victoria Park Hospital. He gave details of some cases and showed numerous X ray pictures.

Dr. G. SCHRÖDER had used a 10–40 per cent. injection of iodipin, but had given it up in favour of bromipin as this was more fluid. He warned his hearers against its use in active tuberculosis of the lungs where it had produced severe focal and general reactions.

Dr. L. S. BURRELL showed X ray photographs of lipiodol in the normal lung and in a tuberculous cavity at the apex; he thought the method of value in some cases of neoplasm, the lipiodol stopping abruptly at the neoplasm and flowing into the normal lung on either side.

Dr. W. G. KINTON had found definite improvement in the condition of patients after two injections.

Dr. F. R. WALTERS conveyed the thanks of the Conference to Dr. Arnand-Delille, who replied briefly.

Resuming at 5 P.M.,

Dr. GEORG SCHRÖDER, of Schömberg, Würtemberg, read a paper on

Specific Stimulation Therapy and Protective Inoculation Measures in Tuberculosis.

As yet, he said, there were no specific remedies for tuberculosis in the human body that would either heal up the lesions or immunise the individual against infection; all remedies that might be regarded as specific had only a more or less specific stimulant action upon tuberculous tissue. The tuberculous patient was in a position of great delicacy as regards the so-called specifics, as these had the power of exciting the formation of tuberculous tissue. Both of these characters distinguished them from non-specific stimulant remedies (protein bodies, radiation, chemotherapeutic remedies). The specific stimulant remedies, continued Dr. Schröder, were not antigen. The antibody theory was not applicable here,

Nor were they immunising remedies. Sensitiveness to tuberculin—i.e., the increased tendency to inflammation of the tissues—so-called allergy—was a manifestation of immunity. In the tubercle-infected body every cell system was in a state of over-sensitiveness to the antigen and its products and also to all other stimuli. Only the living antigen gave rise to this allergy. Any artificial blunting of allergy, in the sense of Hayek, was to be avoided as of no value. In cases with so-called positive anergy, allergy rapidly returned; tuberculous metastases were seen more often in such cases, and visible tuberculous foci did not heal up, in spite of the so-called biological recovery. To maintain and increase allergy was the aim. For this purpose it was unnecessary to distinguish in practice between toxin sensitiveness and tubercle sensitiveness.

In choosing cases for specific stimulant therapy, said Dr. Schröder, the following points were helpful: (1) the clinical-anatomical nature; (2) the allergic behaviour; (3) the state of the blood. Contra-indications especially to be noted were high degrees of fever, tendency to metastasis in other organs, the more serious disturbances of the nervous system and of the organs of circulation, and the preponderantly exudative form of the tuberculosis. The employment of specific stimulant remedies in tuberculosis of children in the secondary stage was most questionable. The useful effect of specific remedies in patients was to be controlled: (1) by careful clinical observations; (2) by repeated testing of the allergic behaviour; (3) by regular blood- and serum-tests (blood count of Arneth, blood-sedimentation tests, lipase, and serum albumin values).

Vaccine Treatment with Living Virus and Protective Inoculations.

"We can only immunise against tubercle," said Dr. Schröder, "if we produce with a living virus a focus which is latent and does not spread." The best-known tuberculosis investigators were agreed on this fundamental point and protective inoculation against tubercle rested on this basis. Some had attempted immunisation with tubercle bacilli from cold-blooded animals (Möller, Friedmann). Selter employed vital tuberculin containing weak but still living tubercle bacilli. Recently Möller had recommended intracutaneous application of fully virulent virus; others, such as Calmette and Langer, employed for protective inoculation non-pathogenic strains of tubercle bacilli weakened in various ways. By personal investigation he was successful in making tubercle bacilli non-pathogenic by growing them in extracts of lymphocytic organs, and in obtaining some protection with his vaccine against bovine tubercle in rabbits, and increasing their resistance against subsequent virulent infection. Whether with any of these methods, which attempted an active immunisation, noteworthy cures of advancing tuberculosis in men were obtainable, was still in doubt. He was very sceptical about passive immunisation, and regarded serum treatment as nothing else than a non-specific stimulant therapy. Of non-specific remedies lipatren had given him the best results in this way. Specific therapy should always be carried out under the strictest clinical control, and usually in a hospital or sanatorium. In ambulant practice the control of patients necessary for these methods of treatment presented many difficulties. The general practitioner might perhaps be in a position to carry out the treatment. The results obtained by such methods could not be stated statistically. Separate cases alone decided the value of such remedies, and many patients profited by them in conjunction with other sanatorium methods.

Discussion.

Dr. HYSLOP THOMSON stated that in his opinion there was no specific therapeutic agent which healed or conferred immunity in tuberculosis; but specific therapy, together with sanatorium treatment, was useful in certain types of the disease. Tuberculin should always be given in minute and carefully gauged doses. Although tuberculin treatment had been largely discontinued in England, both in Germany and in France it was still employed. He believed in specific tuberculin therapy because post-mortem records showed that healing took place by a process of auto-inoculation, and resistance and disease were so evenly balanced that little was needed to turn the scale in the patient's favour with the production of sclerosis. He thought the reasons why tuberculin had gone out of use in England were: the number of tuberculins on the market, the absence of standardisation (he called attention in this respect to a League of Nations Committee on the standardisation of serums), and the variety of media employed for cultivation of the tubercle bacillus. He would like to know on what considerations cases for treatment should be selected, and what form of tuberculin should be administered. Personally he used the intradermal test in diagnosis.

Dr. G. MARSHALL advocated protective inoculation. Its value could be tested, for example, in the Zoological Gardens and in the case of human beings in religious and other communities where inmates are living under standardised conditions.

Dr. TRAILL had observed improvement with tuberculin in chronic cases of tuberculosis in which rest had not done any good. He called attention to the apparent variability of batches of serum from the same laboratories by reason of which similar results in similar cases could not be reproduced.

Dr. CAMPBELL THOMSON considered that tuberculin was useful in local disease, as well as in ocular troubles, but had not proved its value in pulmonary tuberculosis. Moreover, it was not always easy to dissociate the tuberculin treatment from sanatorium treatment.

Dr. T. R. ELLIOTT had used tuberculin for 14 years in pulmonary tuberculosis, but had given it up, using it now only in disease of eyes and lymph glands. Perhaps the cause of failure was that pulmonary tuberculosis was not usually a pure infection, but was complicated by secondary infections. He mentioned that he was experimenting at present with tuberculin administered to babies born of tuberculous mothers and removed at once to a special home for the purpose of protective inoculation.

Dr. ARMAND-DELILLE mentioned that he used *antigène méthylique* (Calmette), a preparation which acted exactly like tuberculin, giving good results without causing fever or undesirable reactions.

Dr. F. PARKES WEBER admired the manner in which Dr. Schröder had explained the modern attitude towards the theory of the action of tuberculin. Tuberculin was a toxin which the individual could accustom himself to some extent, as half the world did against tobacco and one-eighth of the world did against alcoholic drinks. This tolerance—mithridatism, as he called it—towards the toxin harmed the patient because it counteracted the particular effect on the reticulo-endothelial tissues which was one of the chief factors in the cure of tuberculosis.

Dr. WALTERS considered that a large number of individuals were not infected with tubercle until very late periods in life, and therefore it would be difficult to determine when to begin, and for how long to continue, protective inoculations of tuberculin. The selection of cases for injection was also difficult; it was the old problem of how to get hold of the early cases. Cumulative doses were very dangerous.

Dr. SCHRÖDER, in reply, extended a hearty invitation to his English hearers to attend the German congresses.

REBUILDING OF MIDDLESEX HOSPITAL.—Prince Arthur of Connaught last week explained the rebuilding plans to a meeting of subscribers. The new hospital will again take the "H" form, but the court-yard will be wider and all the general wards will be cross-ventilated. The west wing will be built first; it will afford accommodation for a gynæcological unit of 24 beds, the gift of an anonymous donor, and a children's unit of similar size. This portion of the hospital will be associated with the name of Mr. Bernhard Baron. The central cross-piece will be built next and the east wing along Cleveland-street last, the exterior will be of red brick and stone with classical details. His Royal Highness expressed the hope that in due course wards would be provided for paying patients, an object towards which the trustees of the second Lord Ludlow have given £10,000.

GENERAL MEDICAL COUNCIL.

PRESIDENT'S ADDRESS.

THE Winter Session of the General Medical Council was opened on Nov. 23rd, Sir DONALD MACALISTER presiding.

The PRESIDENT began by referring to the death since the last session of Sir Henry Morris, for ten years treasurer of the Council; Dr. J. C. McVail, for the same period Crown Member for Scotland; and Dr. D. N. Knox, who had represented for 12 years the Royal Faculty of Glasgow. Prof. L. P. Gamgee, he said, now took Sir Gilbert Barling's place as the representative of the University of Birmingham, while Sir Humphry Rolleston had resigned his place as representing the Royal College of Physicians of London but had returned as member for the University of Cambridge. He continued:—

Affairs in the Irish Free State.

"The Medical Act, 1926, of the Irish Free State has been continued from August 21st for successive periods of one month, and still by its operation maintains the previous arrangement by which the Medical Acts of this country are made applicable to Southern Ireland. I am informed that conferences have taken place between the Privy Council and other Government departments in this country, together with representatives of the Free State Government, on the question of our future medical relations. As a result proposals have been formulated for an amicable agreement between the Governments concerned. This agreement, if duly adopted and ratified, gives promise of a practicable *modus vivendi* which may be generally acceptable. Probably a further conference will be necessary for its final adjustment. But it must be ratified before the Free State Medical Act expires in February, or new legislation will be required.

New Brunswick.

"The Lord President was pleased to bring before His Majesty in Council the representations of the Executive Committee regarding a recent change of the law in New Brunswick, to which I made reference in June. These representations have been judged to be well-founded, and accordingly an Order in Council, dated Nov. 5th, 1926, has been issued, declaring that New Brunswick no longer affords to the registered medical practitioners of the United Kingdom such privileges of practising in the Province as to His Majesty seem just. The Order of Oct. 4th, 1913, by which reciprocity with New Brunswick was established, is therefore revoked, and medical diplomas and degrees hereafter granted in the Province will not be registrable in the Colonial List.

The British Pharmacopœia.

"The Lord President has further acceded to the request of the Council, formulated on June 4th, 1926, and has taken steps for the appointment of a small committee, on which the Council is represented, with power to make inquiries, to collect information, to receive evidence, and to make recommendations, on the question whether it is desirable to make any, and if so what, alterations in the existing law or practice relating to the preparation or publication of the British Pharmacopœia and to its adaptation to the requirements of the British Empire. I have grounds for stating that this committee is at present engaged in making inquiries and collecting information bearing on the subject of its reference.

The Poisons and Pharmacy and Dangerous Drugs Acts.

"Another committee, appointed by the Lord President, is sitting to consider the whole question of the scope and administration of the Poisons and Pharmacy Acts, and the regulations made thereunder, so far as poisons other than 'dangerous drugs' are concerned. On the nomination of the Executive Committee I have been appointed a member and have arranged to take part for the present in the Committee's inquiries and deliberations, which are now proceeding.

"The Secretary of State for the Home Department is authorised by the Dangerous Drugs Acts Regulations to refer the question whether a particular duly qualified medical practitioner is supplying, administering, or prescribing 'dangerous drugs,' for himself or others (otherwise than as required for medical treatment), to a tribunal of three practitioners in England and three in Scotland respectively, one of whom is to be nominated on behalf of this Council in each case. As speedy nominations were requested, the Executive Committee proposed Sir Humphry Rolleston for England and Dr. Ashley Mackintosh for Scotland, and by invitation sent up also the names of certain other members of the Council, empowered to act on the respective tribunals in the absence of those first named. The members proposed have agreed to act and have been duly approved by the Secretary of State."

Inspection of Indian Universities.

The President announced that Sir Norman Walker and Colonel Needham were revisiting India for a tour of visitation and inspection of the courses of study and examination required for university medical degrees in that country, and to make reports thereon to the Secretary of State for India and to the Council. The President indicated that the opportunities for observation, consultation, and conference offered by the University and other authorities of India would prove of essential service to the cause of medical education in India, while to the Council, as the body whose recognition of Indian medical diplomas for registration is by law equivalent to a guarantee of their sufficiency for efficient practice in medicine, surgery, and midwifery beyond the limits of India, the visitors' reports would be of primary importance and value. It is of interest, he said, to note that in other parts of the Empire a desire is manifested for similar visits by representatives of the Council. The Governments of the Straits Settlements and Federated Malay States have forwarded a cordial invitation to Sir Norman Walker and Colonel Needham to extend their tour to Singapore as official guests. The President had learned from the Deputy Governor that an inspection of the King Edward VII. College of Medicine, Singapore (whose diplomas are already "recognised") by the Council would be of much service, and the Executive Committee of the Council had recommended acceptance of the opportunity.

The President continued:—

Foreign Inspections.

"Sir Edward Coey Bigger has, during the autumn, been travelling in Canada, Australia, and New Zealand as a member of the Empire Parliamentary Delegation. He was provided with introductions, as a member of this Council, to a number of the medical authorities in these dominions. Though his stay at any one centre was perforce brief, I gather from his letters, and from those sent me by presidents, deans, and others, that his visits were everywhere welcomed, and that he was put in possession of information respecting curricula, examinations, &c., which cannot fail to be of interest and value to the Council. He was able also, while the guest of the Governor of Ceylon, to visit its medical college and to inform himself regarding its activities. These experiences suggest that as communications, aerial, marine and terrestrial, are gradually improved, the time may come when it will be feasible, as beyond question it would be mutually beneficial, to organise frequent and regular, rather than rare and occasional, visits to professional bodies overseas, who are occupied, like us, with problems of medical education and registration in distant parts of the Empire."

The New Medical Curriculum.

The President concluded by stating that the Examination Committee and the Education Committee had been actively engaged during the recess

in gathering information respecting the methods and standards of professional examination employed by the licensing bodies, and in ascertaining the extent to which the new medical curriculum is being brought into operation in the United Kingdom. "They may think it expedient," he said, "to present separate interim reports for the information of the Council on these subjects. The spheres of the two committees, however, include much common ground, and I understand that a joint conference may be proposed, for the coördination of their views and experience, before definite reports are submitted to you."

A vote of thanks to the President, proposed by Dr. W. Russell, seconded by Sir Norman Walker, was passed by the Council. The Registrar then read the official notification of the appointment to the Council of Dr. L. P. Gamgee, representing the University of Birmingham, and Sir Humphry Rolleston, Bt., representing the University of Cambridge; these members were introduced respectively by Sir Holburt Waring and Sir Robert Bolam. The Council proceeded to confirm disciplinary action taken by the Dental Board, and to receive reports from the Dental Education and Examination Committee. It then went on to consider a number of penal cases.

MEDICINE AND THE LAW.

Action for Negligence: Alleged Failure to Diagnose Fractured Collar-Bone.

THE action begun on Nov. 16th, in which Mr. E. H. Battershill claimed damages from Dr. A. C. Mann, of Lauderdale House, Gresham-road, Staines, for injuries alleged to be due to the latter's negligence and lack of skill, ended on the 22nd in the disagreement of the jury. Thus each side has to bear its own costs and the plaintiff is at liberty to begin a fresh action if he chooses. Mr. Justice Horridge made no novel pronouncement upon the responsibilities of medical practitioners, and the case depended, as usual, upon its own facts. The plaintiff's story was that he fell down last December and pitched upon his left shoulder. Dr. Mann was sent for, examined him, assured him nothing was broken, and advised putting the arm in a sling. Pain developed, and a fortnight after the accident the patient consulted another doctor, who diagnosed a severe fracture of the collar-bone. A radiograph then taken revealed a fracture and an overlapping of the broken parts to the extent of 1½ inches. The plaintiff's case was that an X ray photograph should have been taken in the first instance, and play was made with the following passage from the annual report of the Medical Defence Union: "In conclusion the president emphasises the urgent desirability of an X ray examination being made in every case of injury to a bone or joint." The main issues of fact appeared to be whether the fracture existed when Dr. Mann first made his examination and whether the displacement of the bone was then ascertainable. The scientific issues concerned the probability of the absence or presence of displacement and the correct treatment accordingly. Expert evidence was given by Sir George Cheatle for the plaintiff and by Sir Herbert Waterhouse, Sir Robert Jones, Sir Joseph Skevington, and Mr. Frank Romer for the defence. Mr. Romer described a case where a jockey (F. B. Rees) broke his collar-bone while racing, the fracture being in much the same spot as the plaintiff's; there had been no initial displacement, the periosteum keeping the bones in place until (during examination) the jockey lifted his arm, whereupon displacement occurred. Sir Joseph Skevington, during his cross-examination, stated that he thought the gap between Dr. Mann's visits on Dec. 9th and 13th was rather wide, and that the evidence of swelling and loss of use of the fingers on the 13th might have suggested a fresh diagnosis and recourse to radiography: but he added that he had known Dr. Mann for many years and had always found him careful and competent.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE:

ANNUAL DINNER.

AT the dinner of the Royal Society of Tropical Medicine and Hygiene, held on Monday last at the Hotel Victoria, London, Dr. Andrew Balfour, the President, in the chair, Lord Balfour was the principal guest. Mr. W. Ormsby-Gore, Under Secretary of State for the Colonies, and Sir Samuel Wilson, the Permanent Secretary, were also present.

Dr. ANDREW BALFOUR introduced Lord Balfour happily, saying that while he could not claim to be a relative of the distinguished statesman, he was of the same clan, and the identity of names in a recent visit to America had been valuable to him, while all the United States recognised Lord Balfour's pre-eminent position.

Lord BALFOUR proposed the toast of the Society, and recalled to his hearers the remarkable growth of inter-communication which had taken place in the past few years between the various divisions of scientific study. Until quite recent days, he said, men of science had remained absorbed in their particular specialties, doing splendid work, but regarding their separate problems from separate standpoints. This was changing, and he pointed to the proceedings which had just taken place at the Inter-Imperial Conference, where the section which had under its attention the various problems of research had recognised the extreme importance of inter-communication, as only by fusion of results could the needs of the world be met. Speaking of the Committee of Civil Research, he claimed for this body that, although it was young, it had already displayed energies which should make it a valuable instrument in the coördination of knowledge, and—as particularly bearing on the interests of those present—he alluded to the work done by the Committee in regard to the problem of the tsetse-fly in Africa. Lord Balfour found it appalling to reflect that, while the creation of the domestic animal was one of the greatest of prehistoric achievements, over a vast area in Africa the use of the domestic animal was prohibited by the ravages of flies. *Homo sapiens*, he said, might be the crown of creation, but the fact remained that he was having a very hard struggle in many places to retain his pre-eminence over organisms which certainly were not the crown of creation. Much investigation was called for by students of tropical medicine if only in this one direction; and in wishing prosperity to the Society he said he could not conceive a greater benefit to the work of the investigators than to have a home in London which, on their return, they could treat as a centre for the record and exchange of experiences. He knew that he had the endorsement of his audience in wishing long life to the Society.

Major E. E. AUSTIN, in reply, said that the particular things which he had been asked to bring out, in narrating the history, objects, and recent activities of the Society, were circulated in printed form among the guests who, he hoped, had read them. He alluded to James Cantlie as the original parent of the Society, in association with Patrick Manson, and pointing out how fortunate the Society had been in its various presidents, deplored the untimely death of Sir William Leishman. He concluded by urging the need of the Society for a house of its own, successful though it had been as a guest in the house of the Medical Society of London.

Mr. ORMSBY-GORE proposed the toast of "Britain in the Tropics and Its Defenders" in eloquent terms. He claimed that for a long period all our colonial possessions had been administered with a view of advancing the welfare of the native peoples, and above all things, he said, the benefit which was most required to turn perilous localities into veritable health resorts was organised medical science. On the many journeys he had taken he had found every-

where evidence that the application of scientific knowledge was necessary for any real advances, and in the struggle of men against the attacks of insects nothing would prevail except that speed and mobility which could only be the outcome of applied science.

Sir JOSEPH COOK, High Commissioner for Australia, in the course of his reply to the toast, begged more of his audience to come to Australia and learn at first hand how fair the prospect was in that country and the territories under its administration. The toast was also replied to by Vice-Admiral Sir J. CHAMBERS, Director-General of the Royal Naval Medical Service.

Colonel W. P. MACARTHUR, Professor of Tropical Medicine in the Royal Army Medical College, proposed the health of the guests, which was replied to by Sir JOHN BLAND-SUTTON, who caused merriment among the guests by describing in strictly heraldic terms the coat-of-arms with its quarterings and crest which he would have suggested if he had been invited to design the armorial bearings of the Society.

The health of the Chairman was then proposed by Sir MATTHEW FELL, Director-General of the Army Medical Service, when Dr. BALFOUR, in reply, thanked Dr. C. M. Wenyon, the Secretary of the Society, and his collaborators for the pains which they had taken in regard to the function.

IMPERIAL CANCER RESEARCH FUND.

ANNUAL REPORT.

A MEETING of the General Committee of the Imperial Cancer Research Fund was held on Nov. 23rd, the Duke of Bedford presiding.

Sir HUMPHRY ROLLESTON, Chairman of the Executive Committee, moved the adoption of the annual report. He pointed out that scientific progress is characterised by successive periods of great activity, with periods of relative quiescence between. Each period of activity is started by some salient discovery or fruitful conception, the working out of which engages for a longer or shorter time the energies of those employed in that field. Cancer research exhibits this phenomenon in a very striking manner. The first period is that following the discovery by Jensen and Borrel of the transplantability of the malignant growths of the mouse. The second period followed the work of Fibiger, Yamagiwa and Ichikawa, and Tsutsui on the actual production of cancer anew, starting with normal animals. If the interest and activity aroused be taken as an indication, the work of Gye and Barnard on cancer causation by ultra-microscopic microbes published 18 months ago can be regarded as starting still a third period in cancer research. A number of papers have appeared in Europe and America, and, as was to be expected, agreement has not yet been reached. Both the facts and their interpretation are in dispute, and in these circumstances it is necessary to exercise patience and continue the investigations. Of the various lines of work bearing on the validity of the conception of Gye, at present in progress in the laboratories of the Imperial Cancer Research Fund, that of Dr. A. H. Begg is farthest advanced. Dr. Begg, whose researches are provided for by the generous donation of Lord Athelstan, has worked with the Rous fowl sarcoma and with another new growth of the domestic fowl which, although differing in structure, behaves in the same way. His results confirm the existence of two factors, as advanced by Gye, in the successful transmission of these tumours, and will shortly be published. The laborious, time-consuming character of these researches cannot be too strongly emphasised, and the public should realise the impossibility of a quick decision on the important problems involved.

Sir ANTHONY BOWLBY seconded the motion, which was unanimously carried.

The PRESIDENT referred to the part played by the late Sir Henry Morris in the initiation of the Imperial Cancer Research Fund and to the fact that the Fund must always depend on donations and legacies if activities were to be prosecuted on a useful scale. It was satisfactory to note that the office expenses, including salaries, printing, stationery and advertisements, worked out at less than 7 per cent. of the total expenditure.

Director's Report.

The report of Dr. J. A. MURRAY, F.R.S., the Director, states that the work of the laboratory during the past year has included studies arising out of the problems presented by the development of tar cancer in animals, in continuation of the earlier work, and the investigations undertaken to test the validity of the conclusions of Gye and Barnard on the ætiology of malignant new growths. A paper by Dr. W. Cramer has been published in the *British Journal of Experimental Pathology* (1926, vii., 1) dealing with the production of tar cancer, in which he has shown that the inception of new growths can be accelerated by an intervention at a site remote from that to which the tar is applied. The other investigations concerned with tar carcinogenesis at present in progress are not yet sufficiently far advanced for report. The Director continues:—

"The work of Dr. Gye, as was to be expected, has aroused the liveliest interest, and has led to a renewed world-wide study of the tumours of the domestic fowl of the Rous type. Several contributions to the discussion have already been published in Europe and in America. The work of Dr. Begg on the Rous tumour and another tumour of the fowl of different structure which behaves in the same way will shortly be published. In our opinion the results obtained can be harmonised with Gye's conceptions with less subsidiary assumption than on any other hypothesis, but some workers in other countries have recorded discordant results and have therefore drawn adverse conclusions. The divergence of opinion is eloquent of the technical difficulties of all investigations on the ultra-microscopic viruses in which a reliable visual control for their presence and identification is absent. In addition, the unfamiliarity of the idea of two distinct factors (each of which is inert by itself) as necessary for the induction of disease, has been a stumbling-block for many who are not familiar with the features of cancer which distinguish it from the recognised infections. It is, however, idle to enter on a speculative discussion of our results and those of other workers at the present time. The subject is essentially one for experimental treatment, and the discrepancies and differences of opinion can be resolved in no other way."

In order to gain an insight into the mechanism underlying the strict specificities of transmission in virus diseases, Dr. G. M. Findlay has undertaken an investigation of inoculable warts in man and in the dog, and of the remarkable epithelial proliferations known as fowl-pox and pigeon-pox. An account has been published, in collaboration with Dr. R. J. Ludford, of the cell-changes in the latter conditions.

The Director described other work in progress at the laboratories of the Fund, and referred to the visit paid by him to America in September, at the invitation of the American Society for the Control of Cancer, to attend the International Conference held at Mohonk, New York State. The conclusions[1] drawn up by the Committee of the Conference, while bringing nothing very new, embodied a sane and practical statement of the approved practice at the present time.

[1] THE LANCET, Oct. 16th, p. 825.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.—The Alvarenga Prize for 1926 has been awarded to Dr. P. S. Pelouze and Dr. F. S. Schofield, of Philadelphia, for an essay entitled The Gamophage. Competitors for next year's prize must send in their essays before May 1st, 1927; further details can be got from the Secretary of the College.

QUEEN ALEXANDRA MEMORIAL.—The contributions to this object now amount to £154,000, of which £74,000 has been raised in Scotland, £71,000 in England and Wales, and £9000 in Ireland. The money is to be used to widen the work of Queen Victoria's Jubilee Institute for Nurses. It is estimated that 3000 more nurses are needed to provide an adequate nursing service.

The Services.

R.A.M.C. COMMISSIONS.

A LIMITED number of commissions in the Royal Army Medical Corps, not exceeding 25, will be offered by nomination in January, 1927. Nominations have been allotted to London and Provincial Medical Schools, and intending candidates should apply to the various Deans. In addition, a certain number of nominations will remain at the disposal of the War Office. Candidates must be under 28 years of age on Jan. 31st, 1927, and will be required to present themselves in London for interview and medical examination towards the end of January. Full particulars may be obtained on application to the Under-Secretary of State, War Office, Whitehall, London, S.W. 1, and applications for consideration should reach the War Office not later than Jan. 10th next.

ROYAL ARMY MEDICAL CORPS.

Capt. H. Alcock to be Maj. (Prov.).

Capts. to be Majs.: K. A. M. Tomory, R. I. Sullivan (and remains secd.), A. R. Ross (Prov.), R. A. Anderson, and B. C. O. Sheridan.

Temp. Capt. R. W. D. Hewson relinquishes his commn. and is granted the rank of Capt.

W. H. D. Priest to be temp. Lt.

ARMY DENTAL CORPS.

Temp. Lt. R. G. Law, Dental Surg., Gen. List., to be Lt.

ARMY RESERVE OF OFFICERS.

G. R. Anderson de Montjoie Rudolf to be Lt.

TERRITORIAL ARMY.

Maj. R. Henry, having attained the age limit, is ret. and retains his rank with permission to wear the prescribed uniform.

Capt. W. Ainslie, having attained the age limit, relinquishes his commn. and retains his rank.

Capt. J. K. Holland, R.A.M.C., to be Div. Adjt., 53rd (Welsh) Div., vice Capt. J. D'A. Champney, vacated.

Lts. J. D. M. Cardell and A. F. G. Guinness to be Capts.

D. N. Buchanan, late Lt., 6th Bn. H.L.I., to be Lt.

General Hospitals.—Lt. K. V. Bailey, from the Gen. List, to be Lt.

ROYAL AIR FORCE.

Flying Officer W. A. Beck is transferred to the Reserve, Class D.2.

INDIAN MEDICAL SERVICE.

Temp. Lts. to be Temp. Capts.: Mohan Singh Segat, Chandu Lal Malhotra, Rajindar Singh Sandhu, Rama Shankar Varma, Shiv Das Suri, Kashi Ram Sahgal, Chandriam Ghurbamal Malkani.

To be Temp. Lts.: Patit Paban Chowdry, Abdul Majid Khan, Hari Krishna Handoo, Prabhakar Narayan Sathe, Balwant Rai Bhaskar, Sangham Lal, Shamsul Haque Wali Mohomed Siddiqui.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 13TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox 218 (last week 302), scarlet fever 1905, diphtheria 1124, enteric fever 49, pneumonia 1155, puerperal fever 44, puerperal pyrexia 170, cerebro-spinal fever 8, acute poliomyelitis 29, acute polioencephalitis 3, encephalitis lethargica 35, continued fever 1, dysentery 21, ophthalmia neonatorum 127. There were no cases of cholera, plague, or typhus fever notified during the week. The total of cases of acute poliomyelitis and polioencephalitis taken together is substantially less than that of previous weeks, the only county notifying more than 3 cases being Middlesex (Enfield 2, Hendon 1, Southgate 1), with isolated cases from the counties of London, Cambridge, Chester, Dorset, Essex, Kent (Broadstairs 1), Lancaster, Lincoln, Nottingham, Rutland (Uppingham 2), Stafford, Surrey, Sussex East, Sussex West, Warwick, Wilts, Worcester, and Yorks West Riding. Of the 218 cases of small-pox 164 were notified from the county of Durham, 6 from Northumberland, 22 from Yorks West Riding, 6 from Lancaster (Ashton-in-Makerfield), and 17 from Derby.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 17 (0) from measles, 5 (1) from scarlet fever, 16 (3) from whooping-cough, 33 (6) from diphtheria, 91 (20) from diarrhœa and enteritis under two years, and 100 (26) from influenza. The figures in parentheses are those for London itself.

Correspondence.

"Audi alteram partem."

THE DISSOLUTION OF INSULIN.

To the Editor of THE LANCET.

SIR,—At the scientific meeting of the State Institute of Hygiene in Warsaw on Nov. 4th of this year, I read a paper on the separation from insulin of two extremely interesting new substances. This preliminary report can be amplified as follows.

From the insulin produced in our Institute (the clinical unit being 0·07 mg.) by an extremely mild fractionation procedure it was found that two substances could be obtained in a crystalline state, which are being designated as A and B.

The substance A is contained in the insulin in a large proportion, the yield corresponding to over half of the weight of insulin taken. Unlike insulin, it decreases the blood-sugar in 70–80 per cent. of normal rabbits, but in those with a high initial blood sugar it decreases the blood-sugar by 10–44 per cent. In rabbits with low initial blood-sugar it produces either no effect or causes increases from 5–20 per cent. This observation has led me to apply the substance clinically on diabetics and non-diabetics in conjunction with Dr. Marceli Landsberg, of Warsaw. From the small amount of cases investigated it would be premature as yet to reach a definite conclusion, but so far we had increases of blood-sugar or no effect in non-diabetics and marked decreases in diabetics.

As to the substance B, it represents a new hormone of complicated and not yet easily understood action. Substance B when injected or given per os causes marked and lasting increases in blood-sugar, so that we have produced hyperglycæmia and glycosuria in normal rabbits with six doses of 0·2 mg. of the substance per day. The substance B causes a high grade dilution of the blood with enormous retention of water, and if one takes that dilution into account blood-sugar increases amounted to over 800 per cent. The rabbits eventually died, and we are investigating the pathological changes, especially in the pancreas, on which a report will follow later.

As the substance B was found in insulin and the latter hormone in a number of organs, and, therefore, probably in food, and as it acts per os, one naturally suspects that this substance may have something to do with the causation of at least certain forms of diabetes.—I am, Sir, yours faithfully,

CASIMIR FUNK.

The Biochemical Department, State School of Hygiene, Warsaw, Poland, Nov. 20th, 1926.

THE MANAGEMENT OF INFECTIOUS DISEASE IN BOARDING-SCHOOLS.

To the Editor of THE LANCET.

SIR,—The address by Dr. A. I. Simey, printed in your last issue, is so carefully thought out and so illuminating that I hope he will pardon me if I make two comments from the point of view of one who was formerly in charge of the city fever hospital of one of our largest towns and who has since devoted himself to the pathology of infectious disease. Briefly stated these are as follows:—

(*a*) Dr. Simey mentions the structural difficulty in providing sufficient isolation accomodation form infectious cases. Has he tried bed, as distinct from ward, isolation? I found that, given marking and disinfection of the utensils of the patient and the wearing of rubber gloves and gown by the nurse when attending to him, it was safe to admit cases of almost any infection, except measles and chicken-pox, to a large ward occupied by patients suffering from a different disease without risk of cross-infection between the patient and the other occupants of the wards

In a school where sanatorium accommodation is necessarily limited, this would seem to be the method of choice.

(*b*) As regards the discharge of patients suffering from scarlet fever, it is, I think, nowadays generally agreed that the nasopharynx is the source of infection. I found that one could with safety discharge scarlatinal patients after four weeks, without regard to desquamation, provided that for a week at least they had been separated from contact with acute cases and had been treated by daily irrigation of the nose. After much experiment, I found that normal saline solution and weak (0·5 per cent.) permanganate of potash were the best, and did not defeat their purpose by setting up irritating catarrh. I found, however, that no amount of previous irrigation was efficacious if the patient was discharged from an acute ward.

The more I see of infectious disease, the less I believe in brick walls and disinfection. Everything seems to point to measures directed to the treatment of the patient himself and to aseptic nursing technique, and that is why Dr. Simey's address is, in my view, so excellent. Old shibboleths, however, die hard.

I am, Sir, yours faithfully,

A. KNYVETT GORDON, M.B. Camb.

Bedford-square, W.C., Nov. 21st, 1926.

PERFORATION OF GASTRIC ULCER DURING X RAY EXAMINATION.

To the Editor of THE LANCET.

SIR,—The case reported by Dr. F. W. Lang in your issue of Nov. 20th is probably an example of an occurrence which is less rare than is supposed. During the past three years I have seen two patients in whom it had happened during X ray examination, in each case at an overseas hospital. I also know of a case where an injudiciously conducted gastric analysis three days after a hæmatemesis was apparently the cause of recurrent hæmorrhage and death.

It is, I think, important to remember that severe pain or hæmorrhage is evidence of an active ulcerative process the extent of which is a matter of conjecture, and with this in mind it is well to postpone all strenuous forms of examination until the alleviation of symptoms gives reason for supposing that the penetration of the ulcer has been arrested. The rapid ingestion of a large mass of heavy material is the very antithesis of the dietetic treatment of gastric ulcer, and the recorded accidents are evidence of the soundness of the principles underlying this treatment.

I am, Sir, yours faithfully,

London, W., Nov. 19th, 1926. T. IZOD BENNETT.

RADICAL OPERATION FOR CARCINOMA OF THE ŒSOPHAGUS.

To the Editor of THE LANCET.

SIR,—I wish to make clear a statement in your report of my remarks at a meeting of the Section of Surgery of the Royal Society of Medicine on Nov. 3rd (THE LANCET, Nov. 13th, p. 1007). The case which I described was one in which an exploratory posterior mediastinotomy had been performed for carcinoma of the œsophagus, but in which the growth, situated just below the arch of the aorta, was too adherent to allow of its being separated from adjacent structures. I mentioned this case in order to illustrate that a mere exploratory mediastinotomy is not, per se, an extremely serious undertaking, as this patient lived for 11 months afterwards. I do not wish to give the impression that the patient lived 11 months after a partial œsophagectomy in the thoracic region, a feat which, as far as I know, has not yet been accomplished in this country.

I am, Sir, yours faithfully,

A. LAWRENCE ABEL.

Harley-street, W., Nov. 17th, 1926.

MEDICAL SCHOOLS AND THE LONDON UNIVERSITY BILL.

To the Editor of THE LANCET.

SIR,—The second reading of the University of London Bill brings to an issue certain considerations which I feel it my duty to lay by your favour before medical graduates of the University of London. I feel deeply responsible towards these graduates, whom I represent both upon the Senate and in Parliament. The large measure of support which was given to me at the Senate election last year, when my poll in the contested election was the largest ever recorded in any faculty—827, as against 281 cast for my opponent—makes me hope that I have interpreted the wishes of my constituents in the action I have taken in opposing the reconstitution suggested by the Departmental Committee. That reconstitution, it seems to me, has not been entirely realised by the medical schools. An admirable analysis of the effect upon the schools of the University of the regulations proposed has been contributed by Dr. Headlam, Bishop of Gloucester, in a letter to the *Times*:

"The control of the University is largely to be in the hands of outside members, and to be taken away from the representative body. Those who desire the independence and self-government of the Universities must feel that this is a most retrograde step. . . . Regulations are to be introduced by which the Senate may require the revision of the constitution, governing body, and statutes of a school of the University, and may interfere with the appeals issued by them, so that no . . . school will be able to appeal for money without the consent of the Council of the University, and will be obliged to consult the University before accepting benefactions. The University also may claim to appoint principal teachers in the schools. . . . The object of the Report and Bill is to give the Senate control over existing schools. If these regulations are given statutory authority the theological colleges will probably cease to exist as schools of the University."

Are the medical schools any more willing to accept these regulations than are, according to Dr. Headlam, the theological colleges? Is it acceptable to the medical schools that their principal teachers—a phrase which must include members of the medical staff—should in the ultimate issue be elected by a Finance Council, nearly half of whom will be Crown and municipal representatives, with no first-hand knowledge of the University and with political rather than educational qualifications for that post?

I happened to be in Chicago seven years ago at the moment when a member of the staff of a certain hospital school had been forced upon the staff by the direct personal influence of the mayor, exercised through municipal representatives upon the governing body of the school. The appointment was so unacceptable to the other members of the staff that they resigned *en bloc*. This action roused the public spirit of the citizens of Chicago, who, at a mass meeting, intimidated the mayor sufficiently to make him cancel the objectionable selection, whereupon the staff resumed their duties.

That seems to me an object lesson of what might happen if hospital appointments are to be influenced by political parties, municipal or governmental. The President, in the course of the debate on Friday, intimated that owing to representations from the theological colleges, he was prepared to insert amendments which should protect their position. I suggest that the medical schools might consider the advisability of following this example, by representations in the same quarter.

I am, Sir, yours faithfully,

E. GRAHAM LITTLE.

Wimpole-street, W., Nov. 22nd, 1926.

A HOSPITAL FILM.—The Prince of Wales last week visited the New Gallery for a private view of a Gaumont film depicting the work of King Edward's Fund. It is entitled "A Hundred Years of Progress," and illustrates a century's advance in the treatment of sickness and accidents.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful in the undermentioned subjects :—

Surgery.—R. Bobo, Paris ; J. M. Moran, Manchester ; D. D. Stidston, St. Mary's Hosp. ; and L. D. Williams, Cardiff.
Medicine.—P. V. Bamford, London Hosp. ; R. Bobo, Paris ; S. B. Browning, Guy's Hosp. ; K. Roberts, Liverpool ; D. Jacobson, St. Bart.'s Hosp. ; and E. H. Waller, Charing Cross Hosp.
Forensic Medicine.—B. Best, Liverpool ; L. O. Jaggassar, St. Mary's Hosp. ; and H. Bundstrom, St. George's Hosp.
Midwifery.—B. Best, Liverpool ; J. De Rosa, Albany and London Hosp. ; B. Elliott, Durham ; L. J. Lawrie, London Hosp. ; L. W. Rose, Guy's Hosp. ; D. D. Stidston, St. Mary's Hosp. ; and N. W. Wood, Middlesex Hosp.

The Diploma of the Society, entitling them to practise medicine, surgery, and midwifery, was granted to S. B. Browning and J. M. Moran.

UNIVERSITY OF LONDON.—A meeting of the Senate was held on Nov. 17th, Sir William Beveridge, the Vice-Chancellor, being in the chair. Regulations were adopted for the recently established Academic Diploma in Anthropology. Mr. D. T. Harris, an internal student, of University College, was awarded the D.Sc. in Physiology for a thesis entitled Biological Action of Light. Sir Holburt Waring has been elected chairman of the Brown Animal Sanatory Institution Committee. The Semon Lecture (1926) will be given by Dr. A. Brown Kelly in the Lecture Hall of the Royal Society of Medicine, 1, Wimpole-street, London, W., on Thursday, Dec. 2nd, at 5 P.M. The subject will be Nervous Affections of the Œsophagus. Dr. Andrew Wylie, President of the Laryngological Section of the Royal Society of Medicine, will take the chair.

UNIVERSITY OF LEEDS.—The Council of the University has made the following additional appointments to the staff of the Cancer Laboratories, which are to be the main centre for cancer research in Yorkshire : Dr. J. S. Young, Lecturer in Experimental Pathology and Assistant Director of Cancer Research, and Mr. J. H. Channon, M.Sc., Biochemist in the Department of Experimental Pathology. Dr. Georgiana M. Duthie and Mr. G. A. Collinson, M.Sc., have been elected to research fellowships.

ROYAL DENTAL HOSPITAL : ANNUAL DINNER.—The annual dinner of the staff and past and present students of the Royal Dental Hospital of London was held on Nov. 20th at the Trocadero (Empire Rooms), at 7 P.M. Mr. W. H. Dolamore occupied the chair and presided over a large gathering, including representative guests. The Chairman, in proposing the toast of "Past and Present Students of the Royal Dental Hospital and Dental School," said with regard to the "Past Students" he would say, expressing his personal sentiments, that, first, they were professional men ; secondly, they were generous professional men ; and thirdly, they were generous professional men who carried out their work in a skilful manner, promoting the advancement of their profession. Three past students were associated with the three stages of metamorphosis through which the Royal Dental Hospital had passed. There was John Tomes, whose name was always selected as that of the representative of English dentistry. He was the moving spirit in the foundation of the hospital and in its early days spent much time searching in second-hand shops for fitments, so that old records would leave the impression that he was rather an antiquary than a scientist. John Tomes was also one of the few men in connexion with dentistry who had given his name to a part of the human body. The dental fibril is not spoken of as the dental fibril but is known as the Tomes fibril. Edwin Saunders was the man to whose generosity the hospital was indebted when it was moved from Soho-square to Leicester-square, and to him they were indebted for the establishment of the Saunders Prize. The man most associated with the next step was Morton Smale, with whose assistance the hospital moved from one side of St. Martin's-street to the other. Without his energy the authorities could never have ventured upon the expenditure of the large sum of money which the present building represents. Mr. Dolamore associated with the historical portion of the toast the name of Mr. J. H. Badcock, an old fellow student of his own who had wandered to Guy's, a school with which they had always had close association.

With regard to the present students he felt diffidence in speaking about them, because of the possible reply, wh ch was entrusted to the last winner of the Saunders scholarship. The present position of the hospital, which was the third subject of his remarks, he found a difficult thing to speak about. He had in the last few years occupied the post of treasurer to the Dental Board, and it had been his duty to be associated with the educational projects of that board, which fortunately was endowed with financial powers. Thus it devoted a considerable sum of money to dental schools, to the giving of bursaries to dental students, and to the promotion of research. But the board insisted that arrangements for the teaching should be adequate when making grants to carry out improvements which were necessary. As a result of such assistance it was certain that sooner or later new schools would also arise, and every school which had not met the situation would find competition up and down the country, probably in schools which were part and parcel of provincial universities.

The President concluded the address by welcoming cordially the support received from the Ministry of Health and the Dental Board.

Mr. Badcock, in reply, dealt with the changes which the school had undergone. To present students he urged the necessity of joining a defence union in order to protect themselves, so far as insurance was concerned, against accidents and illness ; and to join the British Dental Association "in that every man was a debtor to his profession." Mr. M. Lewis replied on behalf of the present students ; and the Dean, Mr. H. Stobie, on behalf of the school. After touching upon the changes in the staff, their loss by the deaths of Mr. J. Howard Mummery and Mr. Douglas Gabell, he recorded recent valuable gifts to the hospital. They were indebted to Mr. E. F. Ackery for the success of the "at home" that afternoon.

The toast of "The Visitors," proposed by Mr. A. L. Packham, was responded to by Prof. T. B. Johnston, Dean of Guy's Hospital Medical School. That of "The Chairman" was proposed by Mr. Norman G. Bennett.

SOCIETY OF M.O.H.'S ANNUAL DINNER.—The annual dinner of the Society of Medical Officers of Health was held in the Georgian Room at the Piccadilly Hotel on Nov. 18th, when the chair was taken by Dr. Robert Snell, M.O.H. for Coventry, and there was a large attendance of administrative and clinical health officers, largely of the younger generation. Sir Robert Bolam, in proposing "The Society," spoke feelingly of the difficulties of the preventive health service, crushed, as it was, between the upper millstone of its secular masters and the nether millstone of a public with a gift for passive resistance. For the solution of these difficulties he offered the cordial coöperation of their colleagues engaged in clinical and consulting practice. Dr. Snell, in reply, spoke of the present modest membership of his Society, numbering 2000 or so, in comparison with the 32,000 members of the British Medical Association, but foresaw the possibility of a time when these numbers might be reversed. He recounted the circumstances of the Society's birth in 1856, when 47 medical officers of health, none of whom had had any experience, were suddenly flooded on to the metropolitan area, so that they were obliged to meet and talk over how they should spend their time. Even now he doubted whether the country availed itself fully of their help, for the military authorities, who early in the present century had organised an *à la suite* sanitary service, had not yet found an emergency serious enough to call it up. "The Guests" were proposed by Dr. Charles Sanders, who remarked that a society might fairly be judged by the guests who assembled at its annual dinner, and spoke of the notable services to the public health rendered by those who were present. The Duchess of Atholl, in reply, said she regarded the school medical service as the most striking advance in public welfare made since 1902, including, as it did, the inspection and treatment of all the school children of the nation and the setting-up of open air, special and nursery schools. She felt that this work had gained much from the presence of women coöpted on education committees. Mr. Philip Snowden admitted that it was the first occasion on which he had met the public health service on a social occasion. For himself, he regretted he was no longer a local administrator, for, he said, "you see things being done." He paid a high tribute to the *esprit de corps*, the technical knowledge, and the enthusiasm of permanent officials. There was, he said, nothing in the world like our civil service, and the great problem "What to do with our educated boys ?" would find its solution in their absorption into public services which would brighten the lives and increase the health of the population at large. Mr. Snowden disclaimed personal familiarity with vital statistics, illustrating his disclaimer with a story of the newly-elected councillor who asked a more experienced colleague the meaning of a death-rate of 9·5. Nine dead, was the reply, and five on the point of death. But, Mr. Snowden went on, loss of working days from sickness was still six times larger than loss from industrial disputes ; financial economy in public health was met by the Proverb of Solomon : "There is that withholdeth more than is meet, but it tendeth only to want." Sir John Rose Bradford also replied in a few well-chosen phrases, in which he characterised the first duty of a physician as the prevention of disease. During the evening Mr.

Norman Williams delighted the company with some familiar songs and ballads. Besides the guests already mentioned there were present at the dinner Alderman Fred. Lee, Mayor of Coventry, Mr. G. A. Powell, Clerk of the Metropolitan Asylums Board, Sir Arthur Robinson, Lieut.-General Sir Michael Fell, Sir A. Boyd-Carpenter, M.P. for Coventry, and Dr. H. B. Brackenbury.

THE LATE DR. J. D. MCCRINDLE.—The death is announced, on Nov. 19th, of Dr. James Doig McCrindle, for many years medical officer of health for the borough of Northampton.

NEW SUNLIGHT CLINICS.—Princess Marie Louise has opened an artificial sunlight clinic at the Mildmay Memorial Hospital, Islington.—Sunlight and X ray departments were opened at Wigan Infirmary last week by Dr. Robert Knox.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Thursday, Dec. 2nd, at 5 P.M., at the house of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., Dr. John Parkinson will lecture for the Fellowship on Cardiac Emergencies. The lecture will be free to members of the medical profession. There will be a two weeks' course from Dec. 6th at the Infants Hospital, under the direction of Dr. Eric Pritchard. It will include demonstrations and lectures, and visits to the Model Pasteurising Plant at Willesden, to Thavies' Inn, and to the Nursery Training School. Courses in obstetrics can be arranged at the Queen Charlotte's Hospital and the City of London Maternity Hospital, and the Fellowship can accommodate graduates with posts as clinical assistants at the Samaritan Hospital. In January there will be the following special courses: In medicine and surgery and the specialties at the Prince of Wales's General Hospital; in cardiology at the National Hospital for Diseases of the Heart (early application is desirable), in diseases of children at the Children's Clinic and the Royal Free Hospital, and in psychological medicine at the Bethlem Royal Hospital. A complete list of the special courses for 1927 may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W., who will also supply copies of other syllabuses, of the General Course Programme, and the *Post-Graduate Medical Journal*.

MEDICAL WOMEN'S FEDERATION.—A half-yearly meeting was held at Leeds on Oct. 22nd, with Dr. Christine Murrell, President of the Federation, in the chair. The national corresponding secretary of the Medical Women's International Association presented a report on the successful meeting of the council of the Association held on August 25th to 28th in Prague. The usual report was made on underpaid posts advertised during the last six months. In all cases where posts were offered at less than the B.M.A. minimum the Federation had written to the women candidates urging them to retire. It was a matter of great satisfaction that of the women who had accepted such posts not one was a member of the Federation. The Loan Fund of the Federation continues to prove of great use to members. Sincere thanks were tendered to Dr. Christine Murrell for establishing a new fund, the John Rains Memorial Loan Fund, in memory of her grandfather, Mr. John Rains, and of his active interest in the education of medical women. It will be subject to the same regulations as the Federation Loan Fund, its object being to make loans to medical women, especially to those starting in practice.

A meeting of the London Association of the Federation was held on Nov. 9th, Miss Elizabeth Bolton, the President, being in the chair. Miss Ida C. Mann read a paper on Routine Examination of the Eyes as an aid to Diagnosis. She emphasized the importance of routine examination of the eyes, including an ophthalmoscopic examination. The cases of ocular disease which most often came in the first instance to the general practitioner, and would be discovered by the routine tests, fell into two groups—namely, (1) those who complained of ocular symptoms and nothing else, and (2) those who complained of other symptoms and made no mention of their eyes. Errors of refraction might cause not only headache but feelings of depression, lack of concentration, fatigue, anxiety, and even, in some cases, nausea and dyspepsia. A suitable pair of glasses would do a hypermetropic clerical worker more good than a month's holiday and might often avert a definite breakdown. Even more important than the detection of errors of refraction was the early diagnosis of glaucoma. This was, of course, not actually a matter for the general practitioner, but the disease could at least be suspected. Miss Mann pointed out the danger of injections of atropin before operation in a subject of chronic glaucoma, and quoted six cases which had been treated for gastric influenza, intestinal colic, food poisoning, and other troubles, before advice was sought for the ocular condition. The communication was discussed by Dr. N. E. Dalby, Dr. E. Casson, Dr. A. Sheppard, Dr. R. Ford.

RONTGEN SOCIETY.—A general meeting of this society will be held on Tuesday, Dec. 7th, at 8.15 P.M., in the British Institute of Radiology, 32, Welbeck-street, London, W. Mr. Cuthbert Andrews will demonstrate the Seriascope, a new instrument for serial radiography, and Mr. W. V. Mayneord will give a paper on Crystal Structure.

INCOME-TAX ALLOWANCE FOR THE DOCTOR'S CAR.—On the question of income-tax allowances to a medical man in respect of his car, Lord Decies writes to point out that the allowance for wear and tear which had been granted to traders in respect of plant and machinery was extended to professions as from April, 1925, thus of course including all medical men. The allowance is one of approximately 10 per cent. on the current value of the car. Previously the only method of claim was by way of renewals and repairs, but the Income Taxpayers' Society, moving through its Parliamentary Committee, was instrumental in bringing about the change to the present system.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—At a meeting of this society held on Nov. 12th at the Miller General Hospital, Greenwich, Dr. H. Nockolds, the President, took the chair, and Mr. Harold Chapple gave an address on Abdominal Pain in Women. A group of women, he said, complained of pain after parturition. There were three tender spots, the sacro-iliac joints (right and left) and the lumbo-sacral joint. Pregnancy caused softening of the ligaments. The symphysis tended to be jammed down, and movement caused pain. Abdominal and lumbar exercises should be ordered after pregnancy and, if the pain persisted, forcible movement under an anæsthetic was required. Pain in the left iliac fossa was common, said Mr. Chapple, and pressure on the pelvic colon caused pain. Bands developed and fixed the colon, after which further bands produced rotation of the bowel on its long axis so that partial obstruction might follow. Abdominal operation was needed to free the bowel and constipation must be avoided. Frequently the ovary was caught with the bowel and dysmenorrhœa developed. The bursting of the Graafian follicle caused pain in these cases. A number of members joined in the discussion.

A PROPOSED CENTRAL INFORMATION BUREAU.—Sir Richard Gregory writes on behalf of the Council of the Association of Special Libraries and Information Bureaux: "As a result of successful conferences which have been held annually for the past three years the Association has been formed and is now in process of incorporation. The Council cordially invites the support of all organisations and bodies, commercial houses, industrial concerns, &c., which attach adequate importance to the collection, treatment, and dissemination of information relevant to their work. The new body will act as a channel through which any inquiring member may be put into direct touch with the source of information required. With the generous assistance of the Carnegie Trust the Association has in preparation a Directory of sources of specialised information in the British Isles; a copy of this will be sent free to each member, as soon as available. In addition it is hoped to establish by coöperation between interested parties, unified policies with respect to abstracting, cataloguing, indexing, and filing."

Membership of the Association is open to all interested bodies. The subscription has been fixed at £2 2*s*. per annum, and to ensure the establishment of a clearing house on an adequate scale not less than 500 members are required by March, 1927. Further details, including a form of application and a list of members will be furnished by the Secretary, 38, Bloomsbury-square, London, W.C. 1.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 40 cases were considered and £140 was voted to 31 applicants. The following is a summary of some of the cases relieved:—

Daughter, aged 66, of L.R.C.S. who died in 1883. When able to work made about 25*s*. a week teaching. Has not been strong since an attack of influenza two years ago, and is now unable to work. A friend left her £42 per annum and she received £16 from a relative. Her rent is 6*s*. a week. Voted £18 in 12 monthly instalments.

Widow, aged 58, of L.R.C.P. Was a clerk until Christmas, 1924, when she was discharged and has found it very difficult to get a post since that time. Late husband was an annuitant of the Fund. Applicant receives £52 from the rent of a house less interest on mortgage and ground rent and repairs. Voted £5 while seeking employment.

Daughter, aged 53, of M.D. St. And. who died in 1913. Has maintained herself by taking temporary posts as a clerk, and owing to recent illness has asked the Fund for further assistance. She has an annuity of £40 per annum. Rent and gas amount to £44 per annum. Private typewriting and clerical work brought her in about £78. Relieved twice, £17 10*s*.; voted £12 in 12 monthly instalments.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., C.B., at 11, Chandos-street, Cavendish-square, London, W. 1.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Anti-Vivisection Petition.

MR. LANSBURY presented a petition in the House of Commons on Tuesday, Nov. 23rd, signed by residents of the Wood Green, Hammersmith, and Lewisham districts praying that the House would pass a Bill withdrawing the sanction of the law from the practice of vivisection.

HOUSE OF LORDS.

THURSDAY, NOV. 18TH.

LEAD PAINT POISONING BILL.

THE House went into Committee on the Lead Paint (Protection Against Poisoning) Bill, the Earl of DONOUGHMORE in the chair.

Lord ARNOLD moved to insert before Clause 1 a new clause prohibiting the use of lead paint in painting the interior of buildings, except in the case of buildings which were excluded from the provisions of the section by an Order of the Secretary of State made after consultation with the organisations, if any, representative of the employers and workers; or painting with lead paint for artistic purposes, or the process of fine lining in such circumstances or in accordance with such conditions as might be prescribed. He said that he held that there was the strongest case for this new clause. It was admitted by the Government that the use of lead paint did lead to serious consequences. Statistics showed that every year some hundreds of men suffered from lead paint poisoning and from 40 to 50 men died every year from its effects. Since he had spoken a week previously the Home Secretary, in reply to a question in the House of Commons, had admitted that this year in the case of one firm in the Potteries there had been three cases of lead poisoning and that one case had proved fatal. The right hon. gentleman admitted that it was a bad case, but he said in effect that the regulations in regard to the system of exhaust ventilation had not been maintained in an efficient state. That was just the point which he (Lord ARNOLD) wished to make. They could not with sufficient effectiveness regulate these matters. Certainly they could not do it in regard to interior painting. He submitted that they ought not to "experiment"—to use the word of the Home Secretary—in a matter of this kind, particularly as doing so involved a breach of faith in respect of the Geneva Convention of 1921.

The Bishop of SOUTHWARK said he hoped very much that the Government would see their way to accept this amendment. He could not see how these Regulations were going to be carried into effect. It was not a matter in regard to which they could safely delay and wait to see how the Regulations worked. They were dealing with human lives and human suffering, and every year they delayed in dealing with this matter effectively added to the sum total of human suffering which could be prevented.

Lord DESBOROUGH said that he regretted that the Government could not possibly accept this new clause. Their lordships knew perfectly well that it was not generally acceptable. Canada was against it and also Australia and South Africa. A committee of experts who considered the whole position with the help of a medical subcommittee really preferred in their own minds a system of regulation rather than total prohibition of lead painting for inside work. If an important change of this character were introduced into the Bill there was not the smallest prospect, having regard to the other legislation which had to be dealt with, that the measure would become law. The Government believed that the desired object could be achieved by regulations. If experience proved the regulations to be insufficient the Government would then be quite prepared to bring in another Bill to deal with the matter.

Earl BEAUCHAMP supported the new clause.

The proposed new clause was negatived by 45 votes to 23.

On Clause 2 (which deals with the prohibition of the employment of women and young persons in painting buildings with lead paint),

Lord BALFOUR OF BURLEIGH moved an amendment to exclude women from the prohibition. He said that he supposed that the Government would rest their case for prohibition on medical grounds. The medical case for prohibition, he believed, rested partly on theory and partly on fact. The theory was that women were more susceptible to lead poisoning than men. He believed that that theory dated from the period when women were engaged, particularly in the Potteries, in very dangerous processes in connexion with lead. The women were on the whole very poorly paid and therefore there were predisposing causes leading to lead poisoning. That theory had become fossilised and crystallised on all subsequent legislation on the point. He did not think that any special inquiry had taken place since women were excluded by regulation in the case of the Potteries. The second point with regard to women was the undoubted fact that in their case lead poisoning led to great racial misfortune as far as the family was concerned. They were very much more likely to have miscarriages and still-births than healthy women, and this fact standing by itself was a good reason for exclusion, but it did not take any cognisance of the other fact that the suffering of the father from lead poisoning produced precisely the same effect. A good many foreign investigators had come to the conclusion that paternal lead poisoning was just as serious from the racial point of view as maternal lead poisoning. Apart from the medical side of the case, if prohibition was applied to women the Government were playing straight into the hands of one of the most powerful vested interests which existed—the trade-unions.

Lord DAWSON said he agreed that there was a prima facie objection to differentiation between the sexes and the onus of proof lay upon those who sought to impose differentiation. He doubted if that case existed, or at any rate if it existed sufficiently proved to justify prohibition. There was a further reason—namely, that it was a serious matter in any way to hinder women in seeking employment where they were able to engage in it. One of the most striking features of the last 50 years was the way in which woman had shown her aptitude in working out her own destiny. She had shown a sureness of touch in extending her activities from one sphere to another, and had widened her outlook in the main with striking success. He would place far more reliance upon the women themselves in deciding whether they should undertake the painting industry or not than on any Regulations. There were a great many occupations which women were precluded from undertaking on account of the fact that they were physically weaker than men. It was, therefore, the more important to give them every opportunity of entering skilled trades for which they were physically suitable; and the painting industry was one of those. They were strong enough to undertake it, the conditions were suitable, unless it could be proved that they were specially prone to the poison of lead. The question, therefore, was: Is the case proved that the proclivity of women is so marked, as compared with men, that it is necessary to prohibit them from taking part in this industry? He freely admitted that if they took the figures at present available there was very striking evidence that lead attacked women, especially young women, more often and with greater severity than men. But those figures were mainly taken from the old days in the Potteries, days which in a great measures were past. In those days the women to a large extent undertook the less skilled, the more dangerous forms of work. They were economically in a less fortunate position, and they were less protected; and there was certainly ground for the view that a large part of that proclivity of women was the result of their economic position rather than of their sex characteristics. At any rate, he would put it as high as this, that unless a further inquiry was undertaken in the light of modern knowledge he would doubt very much whether there was a case for excluding women from the painting trade. The next point was that it had now been established that far and away the most important route for the lead poison to enter the system was by the respiratory tract. The effects of dirty fingers and unclean mouths were indirect: they lowered nutrition, they made the people unhealthy, they lowered their resisting power. But, compared with the respiratory tract, these were relatively unimportant routes for the entry of the lead. If Clause 1 of this Bill, as proposed by the Government, was efficient in its working, and if it was true that by these Regulations, by substituting, that was, wet methods for dry methods, they could eliminate the dust, he thought it was quite likely that the greater proclivity of women would fall very nearly to zero. At any rate, he did not think it was safe to use figures and statistics from the days when the lead industry was not properly regulated. With regard to the very important question of pregnancy, it was quite true that lead was a dangerous poison, in that it produced abortion and miscarriages. But, here again, he thought that the women were quite capable of protecting themselves. If the Regulations under Clause 1 were adequate, if, in other words, dust was prevented—and it was dust that mattered and dust only: that was hardly too strong a statement—if the dust was prevented from entering the respiratory tract of these women they would not abort; and therefore if the measures were efficient the miscarriages would not take place. There was the further point referred to by Lord Balfour of Burleigh, that the lead poisoning, in bringing about miscarriages, very often went through the male as well as the female. The figures were most interesting as well as tragic. For example, there was one set of figures affecting workers in lead mines, where the wives had never worked in the lead mines and the men did work in the lead mines, and 40 per cent. of a given block of pregnancies

miscarried. There they had the poison carried by means of the man. And there were other figures bearing that out. Therefore, if they excluded the women and left the men and their Regulations were bad, they would still have miscarriages. If the Regulations were good—and he believed they were good—they would find that women and men would be protected alike. And the women's trade unions would see to it that the women were protected just as the men's trade unions would see to it that the men were protected. He would call their lordships' attention to Clause 1 of the Bill where the Secretary of State was able to order a medical examination. That got over many of the difficulties, because a medical examination would often discover the early stages of lead poisoning before the sufferer had any symptoms at all. And if in future, as he hoped, through the activities of the Industrial Research Council, a means was found whereby, by some biochemical test, they could say who was prone to lead poisoning and who was not, that would probably be a solution of this problem. The point must be borne in mind that there were a large number of people who could breathe lead with apparent impunity, just as there were large numbers of people who could drink alcohol with comparative impunity, and there were others who after a fortnight's work on lead were apt to be poisoned. Therefore, his suggestion was that the prohibition of women should be withdrawn from the Bill, that it should be left to the option of the Secretary of State to regulate whether they should take part in the industry or not, and he thought the suggestion was a good one that the whole question should go to the Industrial Research Council in the hope of finding a biochemical test whereby they might know whether people were prone or not. If these measures were carried out he thought it would meet all the conditions of the case and meet what to his mind was a great drawback—namely, differential legislation as between men and women.

Lord BANBURY supported the amendment.

Viscount HALDANE said Lord Dawson of Penn had pointed out the very unsatisfactory character of the *ex cathedra* replies that were given off-hand by medical authorities on a question like this. The effect of plumbism could only be ascertained by careful observation in hospitals and by other means, and by careful observation by qualified observers. He felt quite incapable of forming an opinion whether women were in greater danger of lead poisoning than men and of attaching any importance to authorities quoted either in their lordships' House or in the House of Commons. It was a question that needed careful inquiry, and the Government had two bodies—the Medical Research Committee and the Committee on Civil Research—which they could ask to conduct that inquiry.

Lord DESBOROUGH said that for the last 35 years in every Bill dealing with those industries in which lead poisoning was possible the employment of women and children had always been excluded. Noble lords were proposing something quite new. He was quite ready to admit that medical men were not agreed upon this matter. He had known very few cases in which doctors were absolutely agreed, but he thought that the balance of medical opinion was overwhelmingly on the side of the views which were the basis of the policy adopted by successive Governments for the last 35 years. He was sure that Lord Dawson of Penn would agree that these were authorities on this particular matter second to none in this or any other country. They had devoted their lives to the matter. Lead poisoning was a thing rather outside the purview of the ordinary practitioner and ought to be relegated to those who made an absolute speciality professionally of the question. The authorities were Sir Thomas Oliver and Sir Thomas Legge, the Senior Medical Inspector of Factories. This was the opinion of Sir Thomas Oliver: "On the whole, females, particularly young females, suffer more severely from plumbism than males." Sir Thomas Oliver also said: "My contention is that it is largely owing to the power of lead to inflict harm upon the reproductive organs of women that the female sex is so liable to be adversely influenced by the metal." Later on he said: "An interesting point in regard to maternity and plumbism is that while the expectant mother does not show any sign of plumbism and is apparently not suffering from lead poisoning, she transmits to her babe such a legacy of lead that the infant is born dead or dies shortly after birth." In his book on lead poisoning and lead absorption, which was written in conjunction with Sir Kenneth Goadby—also, he believed, an admitted authority—another well-known expert, Sir Thomas Legge, stated unequivocally that women were more susceptible to poisoning by lead than men. The question of lead poisoning was reviewed by a special commission on unhealthy processes appointed by the First International Labour Conference which met at Washington in 1919. There was a great gathering of experts, including a number from the chief industrial countries of Europe. In their report they stated: "What is then the general principle which should be applied in the case of women? That arrived at is one which will probably commend itself to all—namely, only when interference with the function of maternity can be shown to exist, should women's employment be made a bar and lead has been proved medically to be the chief, if not the only, intoxicant, in which this danger is present."

Lord PHILLIMORE supported the amendment.

The amendment was negatived by 35 votes to 17.

The remaining clauses were agreed to and the Bill was reported without amendment to the House.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 17TH.

Guardians and Hospital Treatment.

Mr. WALTER BAKER asked the Minister of Health whether he was aware that the seat of a member of the Bristol board of guardians had been declared vacant because she received treatment following a motor accident in the vicinity of that institution; that it was impossible to remove the patient owing to the serious nature of the injuries, and that the cost of maintenance as a private patient was repaid in addition to the specialist's fees; and whether he was in a position to give an assurance that this special type of disqualification should be dealt with in the measure of Poor-law reform which he proposed to introduce during 1927.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is aware of this case which presents a striking illustration of the anomalies prevailing under the existing law. He is not in a position to say when amending legislation will be introduced, but this matter should certainly receive attention whenever such legislation is considered.

Poor-law Reform.

Mr. SCURR asked the Minister of Health whether he proposed to introduce the Poor-law Reform Bill this session.—Sir KINGSLEY WOOD replied in the negative.

Mental Defective Charged with Attempted Murder.

Colonel DAY asked the Minister of Health whether his attention had been drawn to the charge of attempted murder against Reginald Farndale, aged 11 years, at Chester; and, as this lad was certified as a mental defective three years ago, would he state what action had been taken with a view to providing accommodation for such cases.—Mr. NEVILLE CHAMBERLAIN replied: My attention has been drawn to this case and I am informed that accommodation has been found for the lad in an institution in Gloucestershire. Unfortunately, there is at present a shortage of accommodation for mental defectives throughout the country; and local authorities are being urged to make further provision. The local authorities in the county of Cheshire are now considering a proposal to provide a joint institution to serve the whole county.

The Purity of White Bread.

Rear-Admiral BEAMISH asked the Minister of Health whether he was prepared to make an official pronouncement on the purity of white bread and thus allay the doubts concerning an article of food which was eaten by over 95 per cent. of the population; and whether he will instruct the departmental committee which was examining the question of flour treatment to extend its inquiries with a view to making an authoritative statement on the dietetic value of the people's staple foodstuff.—Mr. NEVILLE CHAMBERLAIN replied: This subject is referred to in a report entitled "Diet in Relation to Normal Nutrition," which was issued by my department a few years ago. I will consider whether it is desirable to extend the terms of reference of the departmental committee, but I am informed that they could not take up the subject referred to in the question until they have disposed of their present reference.

Ventilation on H.M. Ships and Tuberculosis.

Sir BERTRAM FALLE asked the Parliamentary Secretary to the Admiralty whether in view of the incidence of tuberculosis among ratings of the Royal Navy, he would institute an inquiry into whether the ventilating arrangements in living spaces below armour in His Majesty's ships were satisfactory; and whether the regulations laid down for the artificial ventilation of living spaces were properly observed.—Mr. BRIDGEMAN replied: The ventilating arrangements of H.M. ships are the subject of the most careful consideration in every case. The general principles to be followed when fitting the ships were settled by a representative committee a few years ago, and those principles are properly observed when settling details. Moreover, any representations from H.M. ships as to possible improvements in ventilation are considered and acted upon as far as possible. With regard to the last part of the question the necessity of this is considered so important that it is specially reported on by flag officers

at their inspection and a special inquiry is not considered necessary. I may add that I do not agree with the implied suggestion of my hon. friend that the incidence of tuberculosis in the Navy is exceptional.

Malaria in India.

Colonel DAY asked the Under Secretary of State for India what action was being taken by the Government of India with a view to abating malaria.—Earl WINTERTON replied: Public health being a transferred subject, antimalarial measures are a matter for the Provincial Governments except in regard to the health of the army and to central agencies and institutions for research. The measures undertaken include the destruction of breeding places of mosquitoes by oiling and drainage, &c., the prohibition of rice cultivation near certain towns, jungle cutting, propaganda work, the formation of antimalarial [coöperative societies, and the systematic distribution of quinine at low prices. At the same time the area under *cinchona* cultivation is being steadily increased with the object of making India self-supporting in the matter of quinine.

FRIDAY, NOV. 19TH.

LONDON UNIVERSITY BILL.

On the order for the second reading of the University of London Bill, which has already passed through the House of Lords,

Lord EUSTACE PERCY (President of the Board of Education) explained that the object of the measure was to appoint Statutory Commissioners to draw up statutes for the University of London in general accordance with the report of the departmental committee appointed by his predecessor, Mr. Trevelyan. The Bill followed the lines of the Oxford and Cambridge measures. The departmental committee in their report pointed out that the University had practically no financial resources which it could devote to the development of its teaching or research except the balance of examination fees, and yet the total income for the year 1923–24 of the 22 schools at the University in receipt of grants from the Treasury, including the incorporated colleges, amounted to nearly £1,000,000, of which about £360,000 represented recurrent grants from the University Grants Committee, and about £70,000 from the London County Council. The committee defined the object of their recommendations as follows: "We hope to enable the University Grants Committee, the London County Council, and other present or prospective grant-giving bodies to deal with a central University body as to the needs of the University and its colleges, and to make block grants to the University on the basis of such needs. It is fundamentally inconsistent with the idea of a self-governing university that it should not have sufficient financial resources and authority to initiate and pursue a policy of well-balanced development, and to prevent wasteful duplication and competition." While all were agreed, Lord E. Percy continued, that the financial impotence of the University of London, alone among all the universities of the country was an undesirable thing, yet so far as he knew there was no section of opinion in the University of London, and no one connected with it in any way, prepared to accept the present supreme governing body of the University—the Senate as at present constituted—as the authority for allocating grants from public bodies. The University of London had grown as Englishmen liked institutions to grow, on no fixed lines, developing to meet national needs as they arose without any preconceived principle of organisation. That character of the University ought to be preserved and there should be no question of standardising the University of London according to preconceived ideas or analogies with other universities. The departmental committee, broadly speaking, limited its main recommendations to two things. In the first place the committee proposed so to modify the present constitution of the Senate as to give representation on the Senate to the constituent schools of the University, who with the exception of King's College and University College, had no representation as such on the governing body. The second proposal of the committee was the establishment of a new finance council to deal with all questions of finance.

Dealing with criticism of the proposals of the Bill, Lord E. Percy said that it was alleged that the Board of Education had hitherto had nothing to do with the University and that this was a means of establishing Board of Education control over the University. As a matter of fact, the Board of Education had nothing to do with the Bill and would have nothing to do with the University statutes, or with the University, after the statutes were passed. It was well understood that the relations between the Government and the universities should be entirely in the hands of the Privy Council and that would be the position under this Bill. The second criticism related to the number of appointees of the Crown and of local authorities on the proposed new finance council. At present the Crown appointed four representatives on the Senate and the London County Council appointed two. That made six representatives in a total Senate of 26. It was proposed that the Crown and the London County Council should no longer be represented on the Senate, but that those six members should be transferred to the council of 16 members. He agreed with the principle that the Crown and the public authorities should not in exchange for their grants exercise any control over University policy. But the reason for the proposed Crown representation was this: practically the whole of the finance of the University of London was at present in the hands of no university and no college body. It was in the hands of the University Grants Committee, a purely departmental, and if they liked, bureaucratic organisation. The reason for this Bill was to get rid of that undesirable control, and to hand over the allocation of Government money to a university body. It was desirable that the financial administration of a university should be carried out very largely with the assistance of elements outside the university competent in matters of business administration and finance. In London it was far more difficult to get a natural local business element on the council of the University than it was in provincial centres, and the sole object of Crown representation was not to retain any control for the Government over the allocation of grants, but to get in the most efficient way the most eminent men to supply that outside independent element. A third criticism related to the elimination of what was commonly known as the nominated third on the Senate. He recognised that that nominated third had done excellent work in the past, and was capable of doing excellent work. Its elimination was really due to the hard facts of the case. If it were true that they should not interfere with the representation of the graduates or the faculties on the governing body and on the Senate, and if it were true that they should in the University of London secure some organic representation of the schools of the University as such, they could not include that in the miscellaneous element in the Senate without making it so large a body as to be absolutely unworkable. It was only by chance that the nominated third did represent the outside independent element. It was constituted, for instance, of representatives from the Royal College of Surgeons and the Royal College of Medicine. At the present moment there was no representation of the medical schools in the University at all, but the Royal College of Surgeons and the Royal College of Medicine were there at the present moment far more as representatives of the medical schools than as representing outsiders. The same was true of the Incorporated Law Society and the Inns of Court. Finally, the City and Guilds Institute was there now far more as representing the Imperial College of Science than any general body of business opinion or interests. Therefore, the answer to the criticism with regard to the nominated third was that they could not get any proper organic representation of the schools of the University without eliminating some element, and moreover, the functions of the nominated third would be better secured by getting organic representation of the constituent schools on the Senate and by leaving the outside element to the council.

Mr. TREVELYAN (President of the Board of Education in the Labour Government) said that the Labour Party supported the Bill and hoped that it would become law this year.

Dr. LITTLE, the Member for the University, moved the rejection of the Bill. He said he was elected because he took up a position of opposition to the reconstitution of the University on the lines suggested by the Haldane Report. Those who opposed the Bill objected to it in the first place on the ground of its interference with the independence of the schools of the University. The schools were strong institutions having traditions of very many years and even of centuries. They were very largely financially independent and many of them would prefer to renounce grants altogether rather than receive grants on condition that their independence was taken away. The colleges had already raised a warning note against the proposed reconstitution, and he begged the House to have regard to what might happen to a university which was the largest in the world which was likely to be put into a position when its component schools, which were its glory, might depart from it. It was of great importance also to the University to maintain the Imperial link which could only be done by the external examinations. The grants that were proposed to be given constituted little more than a third of the revenue of the University, but the grant-giving bodies would control not only the application of the grants which they gave themselves, but all the funds of the University. He denied that the University of London was unwilling to accept changes, but they contended that it was better that changes should come by agreement, and to force a solution on the University would not be worthy of the House of Commons.

After further discussion the motion for the rejection of the Bill was negatived without a division, and the Bill was read a second time.

The money resolution in connexion with the Bill was also agreed to in Committee.

Encephalomyelitis after Vaccination.

Mr. GROVES asked the Minister of Health whether he had drawn the attention of the Committee on Vaccination, now sitting, to the cases of death from encephalomyelitis after vaccination; and whether he would direct the Committee to make an investigation into the whole question of the risk of spreading encephalomyelitis and other kindred diseases which appeared to be associated with the practice of vaccination.—Mr. NEVILLE CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. As regards the second part, one of the terms of reference of this Committee is to inquire into and report on the practical methods which are available in the light of modern knowledge to diminish or remove any risks which may result from vaccination.

Mr. TREVELYAN THOMSON asked the Minister of Health whether encephalomyelitis was mentioned as a cause of death on the certificates of death in the case of the seven deaths from that disease which occurred shortly after vaccination; whether an inquest was held on any of the cases in question; and whether the lymph used for the vaccinations was issued by his Department.—Mr. NEVILLE CHAMBERLAIN replied: I assume that the hon. Member is referring to seven cases recently discussed in the medical press, and I am informed that, so far as it has been possible to identify these fatalities, in none of the seven deaths was "encephalomyelitis" mentioned on the practitioner's certificate as a cause of death. An inquest was held in one case. In 4 of the 7 cases the lymph used for the vaccination was issued by my Department, and in one instance a proprietary lymph was used, but no information as to the source of the lymph used in the remaining two cases is now available. I may remind the hon. Member that these deaths occurred in 1912, 1922, and 1923.

MONDAY, NOV. 22ND.

Disease in Nigeria.

Viscount SANDON asked the Secretary of State for the Colonies what steps the Government of Nigeria were taking to deal with the critical health and mortality situation as indicated in the annual report.—Mr. AMERY replied: The Nigerian Government is taking every possible step to deal with the outbreaks of disease referred to in the report, which is for the year 1925. I am given to understand that the severe epidemics in the Northern Provinces did not recur in 1926. As regards plague in the Southern Provinces, a special visit was paid to Nigeria by Sir Edward Thornton, of the Union of South Africa, and as a result an energetic campaign has been undertaken with the aid of personnel borrowed from the Army. Thirty-one medical officers have been appointed to Nigeria since January, 1925, and the medical and sanitary departments have been expanded, and will be further enlarged. It is not correct to describe the situation as critical. In a country so large as Nigeria it is quite impossible to prevent the introduction of epidemic disease from time to time.

Condensed Skim Milk as Infants' Food.

Viscountess ASTOR asked the Minister of Health whether he was aware that the importation of condensed skim milk was prohibited in Cuba, the Bahamas, Chile, Argentine, British Honduras, British East Africa, the Straits Settlements, Italy, and other countries; and why he considered that it was not practicable to take similar steps to prevent the sale in this country of a product which he recognised to be unfit for babies.—Sir KINGSLEY WOOD replied: My right hon. friend is aware that the importation of condensed skimmed milk is prohibited in some countries. He is advised that though the absence of fat renders this article unfit for feeding babies, it is not unsuitable for other purposes. Containers in which condensed skim milk is sold are at present required to bear the label "unfit for babies," and from the point of view of the public health he sees no grounds so long as this warning is given, for prohibiting its importation into this country.

Viscountess ASTOR asked if the hon. gentleman would bear in mind that many Medical Officers of Health had reported that the labelling was quite inadequate as a means of ensuring that this condensed milk was not used for babies, and would it not be possible to get a more prominent label, as this was a real danger in many parts of the country.

Sir KINGSLEY WOOD said he would look into the question of the labelling and see what could be done.

Infantile Paralysis among Schoolboys.

Viscount SANDON asked the Minister of Health, in order to obviate the danger of infantile paralysis being spread by reason of boys being withdrawn from infected schools by parents, if he would take steps to prevent any school so infected from being closed down or the boys leaving.—Mr. NEVILLE CHAMBERLAIN replied: I am not empowered to take the course suggested, but I am always ready to arrange for the medical officers of my Department to confer with the school authorities as to the precautions appropriate to any outbreak of infectious disease.

TUESDAY, NOV. 23RD.

Hospitals and Coal Priority.

Col. LANE-FOX (Secretary for Mines) stated in reply to Mr. Briant that on the list of priority consumers of coal, hospitals, workhouses, and similar institutions stood first, and manufacturers of drugs and medicines last.

Segregation of Children from Mental Defectives.

Mr. DAY asked the Minister of Health what action had been taken by the Walsingham, Norfolk, board of guardians, following the visit of Inspector Bushell, to segregate children from mental defectives.—Sir KINGSLEY WOOD replied: All children over three years of age have now been removed from this institution; the only mentally deficient persons associating with the children in the institution are the mothers of those children.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

WEDNESDAY, Dec. 1st.—5.30 P.M., TROPICAL DISEASES AND PARASITOLOGY. Papers: Dr. R. T. Leiper: Tyranny of Nomenclatural Rules in Medicine. Dr. S. V. van Nierkerk: Hermaphroditism in Native Labourers in Johannesburg. Miss I. Hiles: Serological Tests in the Diagnosis of Hydatid Cyst. Dr. M. A. Azim: Coccidium in White Rats in England (communicated by Dr. J. Gordon Thomson). Dr. W. Broughton-Alcock: A Spirochætic Infection with Neuroses and Perforation of the Ileum. 8.30 P.M., SURGERY. Discussion: The Treatment of Gangrene of the Extremities. Opener: Prof. G. E. Gask. Mr. Sampson Handley will follow.

FRIDAY.—5 P.M., LARYNGOLOGY. Cases and specimens will be shown at 4 P.M. by Dr. Andrew Wylie (President), Mr. Frank Rose, Mr. Norman Patterson, and others. 8.30 P.M., ANÆSTHETICS. 8.15 P.M., OTOLOGY, MEDICINE, AND NEUROLOGY. Special Discussion: The Relation of Abnormalities of the Blood Pressure to Diseases of the Ear, to be opened by Sir William Milligan, followed by Dr. Lewis Smith (for the Section of Medicine), Dr. W. J. Adie (for the Section of Neurology), Mr. G. J. Jenkins (for the Section of Otology.)

SATURDAY.—10.30 A.M., OTOLOGY. Cases and specimens will be shown at 9.45 A.M. by Mr. Philip Franklin, Mr. Leslie Powell, Mr. Banks-Davies, and others. Papers: Mr. George Wilkinson: Have We a Resonance Theory of Hearing, or only a Resonance Hypothesis? Sir James Dundas-Grant: Remarks on the Use of Weber-Liel's Intratympanic Tube in Chronic Eustachian Catarrh.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Nov. 29th, to SATURDAY, Dec. 4th.—FELLOWSHIP OF MEDICINE. Special lecture at the Medical Society, 11, Chandos-street, Cavendish-square, W. Thurs., Dec. 2nd, at 5 P.M., Dr. John Parkinson: Cardiac Emergencies. Free to members of the medical profession. —ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Special course in medicine, surgery, and gynæcology. —ST. JOHN'S HOSPITAL, Leicester-square, W.C. Special course in Dermatology.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. Late afternoon course (5 P.M.) demonstrations upon selected cases. Further information from the Secretary of the Fellowship of Medicine.

UNIVERSITY COLLEGE, Gower-street, W.C.

WEDNESDAY, Nov. 24th.—5 P.M., Dr. C. H. Best: Insulin. (Third of four advanced lectures in Physiology.)

POST-GRADUATE HOSTEL, Imperial Hotel, Russell-square, W.C.

TUESDAY, Nov. 30th.—9 P.M., Mr. W. E. Miles: Fistula.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Nov. 29th.—10 A.M., Surgical Clinic. 2 P.M., Medical Cases in the Wards. 2.30 P.M. to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 P.M. to 5 P.M., Medical, Surgical, Throat, Nose, and Ear Clinics. Operations.

WEDNESDAY.—2.30 P.M. to 5 P.M., Medical Skin and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinic. 2.30 P.M. to 5 P.M., Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 P.M. to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.
On Monday, Nov. 29th, and Friday, Dec. 3rd, at 2.30 P.M., there will be special demonstrations of Surgical and Medical (Children) Cases by Mr. H. W. Carson and Dr. Bruce Williamson respectively.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Nov. 29th.—10 A.M., Mr. Macdonald: Genito-Urinary Operations. 12 noon, Mr. Simmonds; Fractures and Applied Anatomy. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
TUESDAY.—12 noon, Dr. Burrell: Demonstrations of Chest Cases. 2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.
WEDNESDAY, Dec. 1st.—10.30 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 2 P.M., Dr. Owen: Medical Out-patients.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Dept.
FRIDAY.—10 A.M., Sir Henry Simson: Gynæcological Operations. 10.30 A.M., Dr. Dowling: Skin Dept. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Dept. 10 A.M., Dr. Saunders: Medical Diseases of Children.
Operations, Medical and Surgical Out-patients, Special Departments, daily, 10 A.M. to 5 P.M., Saturdays, 10 A.M. to 1 P.M.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Dec. 3rd.—4 P.M., Mr. Archer Ryland: Demonstration of Some Museum Specimens.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street.
THURSDAY, Dec. 2nd.—4 P.M., Dr. Theodore Thompson: Encephalitis in Children.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 30th.—5 P.M., Dr. J. H. Sequeira: Tuberculosis Cutis (2).
THURSDAY, Dec. 2nd.—5 P.M., Dr. Haldin-Davis: Acne. Rosacea.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Nov. 30th.—4.15 P.M., Mr. F. H. Westmacott: Middle-Ear Suppuration.
FRIDAY.—4.15 P.M., Dr. G. R. Murray: Hypothyroidism and its Treatment.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Dec. 3rd.—3.30 P.M., at the Royal Infirmary: Mr. Pooley: Infections of the Lacrymal System.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Dec. 1st.—4 P.M., Dr. P. C. Varrier-Jones: Settlements for Tuberculous Workers.

CHADWICK PUBLIC LECTURES.
THURSDAY, Dec. 2nd.—8 P.M. (in the Barnes Hall, Royal Society of Medicine), Sir Henry Gauvain: Sun, Sea, and Open Air in Relation to Health.

JAMES MACKENZIE INSTITUTE FOR CLINICAL RESEARCH, St. Andrews.
TUESDAY, Nov. 30th.—4 P.M., Mr. A. Ernest Maylard: The Bearing of Such Conditions as High Blood Pressure, Albuminuria and Glycosuria on the Performance of Surgical Operations. Discussion to be opened by Dr. Norman McLeod.

Appointments.

PICKWORTH, F. A., M.B., B.S. Lond., has been appointed Director to the Research Board for Mental Disease, City and University of Birmingham.

Vacancies.

For further information refer to the advertisement columns.

Birmingham and Midland Eye Hospital.—Two H.S.'s. £120 and £110 respectively.
Brighton, Borough Infectious Disease Hospital and Sanatorium. Res. M.O. £350.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. At rate of £100.
Brighton, Sussex Maternity and Women's Hospital.—Second Res. H.S. £100. Also Second Hon. Obstet. Phys.
Buxton and District Cottage Hospital.—Aural Surg.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
Cambridge, Papworth Sanatorium and Village Settlement.—H.P. At rate of £100.
Cancer Hospital, Fulham-road, S.W.—Pathologist. £1000. Also H.S. At rate of £100.
Canterbury City and Borough, &c.—M.O.H. and School M.O. £800.
Charing Cross Hospital, W.C.—Asst. P.
City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.—Res. M.O. £250. H.P. At rate of £100. M.O. to Out-patient Dept., At rate of £150.
Dublin, Dr. Steevens' Hospital.—Reg. Surg.
Dudley Guest Hospital and Eye Infirmary.—H.S. and Asst. H.S. £175 and £150 respectively.
East African Medical Service.—Two Asst. Bacteriologists. £600.
General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.
Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.S. Also Cas. Surg. O. to Out-patient Dept. Each at rate of £100.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £50. Also Surg., Phys. to Out-patients. Anæsthetist. £15 15s.
Hull Royal Infirmary.—Asst. H.P. At rate of £130.
Infants Hospital, Vincent-square, Westminster.—Med. Ref. £120.
London Homœopathic Hospital.—Three Res. M.O.'s. At rate of £100.
London Hospital, E.—First Asst. and Reg. to one of the five Surgical Firms. £300.
London Lock Hospital, 91, Dean-street, W.—Clin. Assts. to Out-patients.
Lucknow University.—Prof. of Anatomy. Rs.1450 per mensem.
Macclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.
Manchester Royal Infirmary.—Asst. Res. Surg. O. At rate of £150. Also Res. M.O. £200.
Margate, Royal Sea-Bathing Hospital for Surgical Tuberculosis.—Two H.S.'s. At rate of £200.
Melbourne University.—Director of Tubercular Research. £1000.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen and Jun. Res. M.O.'s. £140 and £100 respectively.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Norwich, Norfolk and Norwich Hospital.—H.P. and H.S. Each £120.
Nottinghamshire County Council, &c.—Asst. Sch. M.O. and Dist. M.O.H. £700.
Perth, James Murray's Royal Asylum.—Asst. Phys. £300.
Prince of Wales's General Hospital, N.—Hon. Clin. Assts.
Queen Mary's Hospital for the East-End, Stratford, E.—Res. M.O., H.S.'s., H.P.'s., &c.
Royal Army Medical Corps.—Commissions.
Ruthin Castle, North Wales.—Jun. P. At rate of £200.
Salford Royal Hospital.—Two Hon. Asst. Surgs.
St. John's Hospital, Lewisham, S.E.—Cas. O. At rate of £100.
Swansea General and Eye Hospital, Beck Laboratory.—Asst. Pathologist £500.
University College Hospital, Gower-street, W.C.—Two Clin. Assts. to X Ray Dept.
West Bromwich County Borough.—M.O.H. £1000.
West London Hospital, Hammersmith, W.—Phys. Also H.S., H.P., Res. Asst. Cas. O. and Aural and Ophth. H.S. Each at rate of £100.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Ripponden (Yorks), Earl Shilton (Leicestershire), Denbigh (Denbighshire), and Torrington (Devon).

Births, Marriages, and Deaths.

BIRTHS.

BAXTER.—On Nov. 13th, at Wollaston, Northants, the wife of Stephen E. Baxter, M.R.C.S., L.R.C.P., of a daughter.
COX.—On Nov. 19th, 1926, at 49, West Cliff, Preston, Lancashire, the wife of G. Lissant Cox, M.A., M.D., of a son.
KERR.—On Nov. 12th, at 64, Clarence Gate-gardens, N.W., Gwendolin, the wife of R. A. Kerr, *M.C.*, M.B., F.R.C.S., of a son.
KINGDON.—On Nov. 20th, at Knayton, Thirsk, Yorks, the wife of A. T. L. Kingdon, M.R.C.S., L.R.C.P., of a daughter.
STUTTAFORD.—On Nov. 20th, at Horning, near Wroxham, Norwich, the wife of W. J. E. Stuttaford, *M.C.*, M.R.C.S., L.R.C.P., of a daughter.

DEATHS.

COOPER.—On Nov. 20th, at Orchards-way, Highfield, Southampton, William Frank Cooper, L.R.C.S., L.R.C.P. Edin., aged 61.
JAMESON JOHNSTON.—On Oct. 8th, 1926, at 16, Fitzwilliam-place, Dublin, after a very short illness, George Jameson Johnston, M.A., F.R.S.C.I., late professor of surgery, Royal College of Surgeons, Ireland.
LOWE.—On Nov. 20th, at Lyndhurst-terrace, Weymouth, Charles Henry Lowe, M.R.C.S., late of Burton-on-Trent, aged 77.
LOWER.—On Nov. 20th, at St. Blazey, Cornwall, Nynian Yeo Lower, M.R.C.S., L.R.C.P., late of Presteign, Radnorshire, aged 54.
REID.—On Nov. 17th, at Richmond (Surrey), John Reid, M.A., M.D. Aberd., aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE ACTIVATED SLUDGE PROCESS OF SEWAGE TREATMENT.

Abridged from the Chadwick Lecture delivered at Southampton on Oct. 25th, 1926,

BY H. T. CALVERT, D.Sc., F.I.C.

AT an early date imperfect drains were laid with the object of keeping the neighbourhood of dwellings reasonably dry, but the solid waste products of human existence were allowed to accumulate near the dwellings, and it was only when a supply of water became available that the opportunity arose in the more thickly populated districts of swilling the refuse into the drains and thus into the nearest watercourse. This was the first step in rendering the dwellings more cleanly, but the resulting evils of river pollution made it necessary that further steps should be taken. At first there was little or no opposition to this growing pollution, and the general impression seemed to be that the use of rivers was to carry away sewage and trade refuse, but the burden which they were called upon to bear was beyond the power of their purifying ability. In spite of official inquiries matters were allowed to drift from bad to worse, but in 1876, as a result of a Royal Commission, the Rivers Pollution Prevention Act was passed, though it was not until county councils were formed in 1888 that any real progress was made and the necessity for treating sewage before discharge into rivers and streams was brought home to local sanitary authorities.

The Principle of Activation.

All artificial biological methods of sewage treatment—whether by means of contact beds, percolating filters, or activated sludge—are really developments of the "intermittent downward filtration through land" process of Frankland, and when once the principles underlying that process have been grasped the mechanism of these newer processes is easily understood. Oxygen is the purifying agent and the air furnishes a practically unlimited supply of this gas. If oxygen is brought in contact with organic matter at the ordinary temperature oxidation proceeds only slowly, but at higher temperatures the same process takes place more rapidly. It is then termed combustion, and this is the process which takes place in refuse incinerators. It is obviously impracticable to evaporate sewage and to oxidise the remaining organic matter in a refuse incinerator, and hence in sewage purification we have to aim at oxidising the organic matter by introducing oxygen in the concentrated or active form in which it occurs in various chemicals (such as permanganates) or by having present along with the oxygen some other substance which hurries up the process of oxidation. The former method proves more expensive than the latter, which is the essential feature of land treatment and artificial biological methods. The other substance which hurries up the process of oxidation is a biological one, either bacteria and other micro-organisms or even larger living organisms, but the actual mechanism of the change is not yet thoroughly understood. It would lead us too far from our subject to discuss the various theories which have been formulated to explain the biological oxidation of sewage, but it may serve a useful purpose to cite the analogous process of manufacturing vinegar from wine. Wine (for this purpose a weak solution of alcohol) is allowed to trickle over shavings which have been inoculated with a specific bacterium (*Mycoderma aceti*), and in doing so the alcohol in the wine is oxidised to acetic acid; the wine is converted into vinegar. Vinegar is an oxidation product of wine, just as carbon dioxide and nitrates are oxidation products of the organic matter in sewage. The analogy serves to suggest that the future may teach us to recognise, to cultivate, and to use specific organisms for the better oxidation of the organic matter of sewage.

Apart from all theories we are on safe ground if we say that the presence of organisms enables the oxygen of the air to oxidise the organic matter in sewage very rapidly, and it remains to consider what are the best methods of bringing the three reacting substances—the organic matter of the sewage, the oxygen of the air, and the organisms—into as intimate contact as possible. In land filtration each particle of the soil becomes coated with a gelatinous film derived from the organic matter of the sewage. This film forms a nidus for organisms and at the same time such an extensive surface that it attracts more organic matter out of the sewage and a partially purified liquid passes on to the next particle of soil, where the process is carried a stage further. Following the sewage comes a supply of air, and we thus have the three reacting substances together. Oxidation takes place and the gelatinous film on the soil particle is ready for another dose of sewage. In the case of contact beds and percolating filters the mechanism of the process is somewhat similar, except that the material of the beds and filters is very much larger in size than the soil particles, whilst in the case of the activated sludge process the particles of soil or other filtering material are entirely dispensed with and the gelatinous film or activated sludge is agitated with the sewage and air is either blown in or supplied at the surface of the agitated mixture of sewage and sludge.

From what has been said it will have been gathered that activated sludge is produced from the organic matter of sewage and that it is an oxidation product of this organic matter, but the exact function of the oxygen of the air in the production of activated sludge is as yet undetermined. It may be that it fosters the growth of micro-organisms pre-existing in the sewage or even in the air; or that it kills off another kind of micro-organism; or again it may be that it destroys certain constituents of the organic matter or sludge which are inimical to its use for the purpose of purifying further quantities of sewage; or the action may be a mechanical one in developing an enormous surface area on the sludge, but experiments have shown that the addition of chloroform, toluol, and other substances which kill micro-organisms, to a fully activated sludge impair or destroy its activity. We are therefore justified in assuming that activated sludge owes its activity, in great part at any rate, to the micro-organisms which it contains.

[Dr. Calvert described various methods of applying the activated sludge process to the treatment of sewage, notably those used in this country at Worcester, Manchester, Bury, Birmingham, and Sheffield respectively. He continued:—]

Certain Difficulties.

Before the process is applied to any sewage, or indeed before any kind of sewage treatment works are constructed, it is of prime importance that full information should be obtained as to the volume and nature of the sewage which may be expected to reach the works.

Included in the question of volume of sewage is the question of storm water, but the indications of existing plants are that if the final settling tanks are of sufficient capacity the plants are able to deal with three times the dry weather flow for periods which are generally likely to occur in times of storm. This, of course, presupposes that the first rush of storm water does not wash out of the sewers too much solid matter which has been deposited in the sewers during dry weather and become septic, and also that the flow of storm water is not so prolonged as to give rise to the phenomenon which has been termed "bulking" of the sludge.

This phenomenon, about which little definite information is available, is due to a condition which activated sludge assumes under certain unknown conditions. At times it is found that the sludge, in a comparatively short space of time, say a few hours, swells up and occupies a much larger volume of the tank space than normally. If the normal amount of sludge is, say, 20 per cent. (measured after settlement for one hour) it is sometimes found that the sludge, whilst containing no more dry solid matter, will occupy a volume twice as great or even greater. Under such circumstances it is often difficult to maintain the requisite amount of sludge in the aerating or agitating tank and to prevent it escaping with the effluent from the final settling tanks.

Included in the question of the nature of the sewage we have not only the variations in strength due to varying water consumption and to variations due to the class of the population tributary to the sewers, but also the question of any trade refuse which may be admitted to the sewers. Here our knowledge is not by any means definite, but the indications are that with domestic sewage the application of the process presents little difficulty. With trade refuse, however, the matter is otherwise, and difficulty has been experienced with such classes of refuse as spent gas liquor, brewery waste, oil and tar, and refuse from the manufacture of dyestuffs. The process is able to deal with certain proportions of these classes of refuse in the sewage, but it would appear that when once the sludge has acclimatised itself to those proportions any very material variation either up or down is likely to cause difficulty, either by depriving the sludge of its activity or by giving rise to "bulking."

These difficulties can be counteracted to some extent by the preliminary treatment to which the sewage is subjected before it enters the activated sludge tanks. Such preliminary treatment should always include screening and the removal of grit in detritus tanks.

The final settling tanks, following the aeration, agitation, or activated sludge tanks, serve the purpose of separating the activated sludge from the purified sewage and concentrating the former for return into the process tanks or for disposal of the surplus, for more is always produced than is required in the process tanks. The form of construction which has been almost always adopted for these tanks is that of the Dortmund or hopper-bottomed tank.

The volume of sludge which is returned from these tanks into the process tanks is regulated according to the amount which it is desired to maintain in the process; 15 or 20 per cent. (measured after settlement for one hour) may be regarded as an average amount.

It is difficult to give figures relating to the cost of the process, the power consumption, and the size of plant which may be regarded as the smallest economical unit, since local circumstances vary so enormously. The capital constructional costs of a plant to deal with a daily dry-weather flow of a million gallons of average domestic sewage, and with three times this volume in wet weather, would be under average conditions, approximately £30,000, and the annual working costs from £1200 to £1400. The power required has been found to vary from 15 to 30 h.p. per million gallons, but the price of electrical energy varies at the several plants from ½d. to 4d. per Board of Trade unit. Skilled supervision is necessary where the process is installed, and it is not usual, though it might be advantageous, to provide such supervision at small works where the daily dry-weather flow is less than, say, 500,000 gallons.

A Modified Process.

The methods of application of the activated sludge process aim at what is termed the complete purification of the sewage—that is, the production of an effluent which is non-putrescible and which is not likely to give rise to a nuisance when discharged even into the smallest watercourse. We will now turn our attention for a moment to a modification of the process which has been worked out at Birmingham and which promises a wider applicability.

At Birmingham the basic idea is to stop the purification process at an early stage, separate the partially purified liquid from the partially deactivated sludge, and reactivate the sludge separately for re-use in the process. The partially purified liquid is then passed on to existing percolating filters at a rate of two or three times the ordinary rate of feed. The short period of agitation enables the plant to be constructed correspondingly smaller, but the reactivation or reaeration of the sludge in the concentrated form is a more difficult matter than in the dilute form, so that the size of plant necessary for this part of the process is not reduced strictly in proportion to the concentration of the sludge. A large-scale plant to deal with 2½ million gallons per day has been operated on these lines for some time at Birmingham, and the size of the plant is now being trebled. Local conditions make the process peculiarly applicable. The settlement tanks are situated some four or five miles higher up the valley than the percolating filters, and in traversing the carrier between the two portions of the works the tank liquor becomes septic and is liable to give rise to nuisance from smell when it is sprayed on to the percolating filters. The partial treatment, or bio-flocculation, as it has been termed, for it consists essentially in a flocculation of the colloidal organic matter in the sewage, deprives the sewage of its septic character, so that no nuisance from smell is caused when the sewage is sprayed on to the filters, and owing to the high rate of feed of the filters the normal extension of filter area to meet the needs of increasing population is avoided. It is also probable that with this partially purified liquor the question of fly nuisance on the percolating filters will be lessened.

The process is a peculiarly inviting one, for there are few large towns in a position to afford absolutely new sewage disposal works, and most of the activated sludge plants installed in this country have been adjuncts to existing works which required extension. In most cases they deal with a portion of the whole flow of sewage and not with the whole flow and its daily variations. The process in use at Birmingham affords an opportunity of extending existing works, especially where percolating filters exist, without separating the works into two parts and without constructing further expensive percolating filters.

The Nature of Activated Sludge.

When seen in the aeration tanks activated sludge has a brown flocculent particulate appearance, and the experienced eye can judge its activity, knowing that a greyness and ultimately a blackness comes over it when it loses its activity. Under the microscope great differences are seen in activated sludge produced at different places.

From its mode of formation activated sludge contains the whole of the mineral matter present in the settleable and colloidal solids of the sewage, and such portions of the organic matter as have not been oxidised to gaseous or soluble forms. The particles of sludge are heterogeneous masses which have a tremendous surface per unit of weight, and they teem with life. Many forms of bacteria and other organisms have been recognised in the sludge, but up to the present our knowledge of these forms of life and their functions is very limited. It would appear that the phenomenon of "bulking," to which reference has been made, is associated with the preponderance of protozoal forms.

Activated sludge has a higher percentage nitrogen content than ordinary sewage sludge, and percentages of 5 or 7, measured on the absolutely dried sludge, are not uncommon.

Experiments have demonstrated that activated sludge possesses a higher manurial value than ordinary sewage sludge and that its nitrogen is as available for plant life as the nitrogen of sulphate of ammonia. For horticultural work and the dressing of golf greens and in market gardens the activated sludge produced at Milwaukee and Chicago has been dried and put up in 100 lb. bags and has found a ready sale. The problem of using activated sludge as a fertiliser has not yet been tackled seriously in this country, and at the various works where it is produced it has been dealt with much on the lines in which ordinary sewage sludge has been dealt with—by shallow ploughing into the land, by lagooning, or by drying on special drying beds and then spreading on the land. At most works it is mixed with the ordinary sewage sludge produced at another part of the works, but in no case has a preliminary dewatering in presses or filters with subsequent drying by heat in mechanical driers proved successful. At Milwaukee and other places in America very large plants have been constructed to deal with the sludge on these lines, but whether the success which is reported from these plants is due to some difference in the American sludges or to a want of vision on our part is not clear.

There is still a chasm of ignorance concerning the activated sludge process of sewage treatment. Much more research will have to be done before we are in a position to define the future possibilities of the process, but there is every reason to expect that these possibilities will be large.

OPHTHALMOLOGY IN EGYPT.

MODERN Egyptian ophthalmology, which owes its inception to the late Sir Ernest Cassel, who endowed the ophthalmic hospitals, and to Mr. A. F. MacCallan, who during his twenty years' residence in the country organised their work, continues to flourish. This year's report of the Ophthalmological Society of Egypt records an increase of three permanent and three travelling hospitals during the years 1924 and 1925, the number of new patients treated in the latter year having increased to 236,903. The main cause of blindness, as in all Eastern countries, is trachoma, but it is encouraging to read that whereas in 1919 the percentage of blindness in one or both eyes among the patients was 15·3, this percentage has been gradually reduced until in 1925 it was 10·4. There is an entertaining paper in the current *Bulletin* of the Society by Dr. Max Meyerhoff entitled New Light on the Early Period of Arabic Medical and Ophthalmological Science. It contains photographs of anatomical sketches from an Arabic manuscript of the year 1003 A.D., now preserved in a private library at Cairo. One of the diagrams shows the external ocular muscles, and another the decussation of the optic nerves at the chiasma.

DENTAL CARE OF MOTHERS AND YOUNG CHILDREN.

AT the quarterly meeting of the National Baby Week Council, held at Carnegie House on Nov. 17th, a discussion on Dental Care of Expectant and Nursing Mothers and Children under Five was opened by Dr. Helen P. Dent, of Leicester. She said that anæmia, digestive troubles, and debility followed an unhealthy mouth, and it was quite possible that pyorrhœa might have a share in the production of puerperal sepsis. There was much ignorance and prejudice amongst mothers in regard to the need and the safety of dental treatment during pregnancy. The provision of dental treatment for mothers should always be part of the local authority's maternity and child welfare scheme, and it should be available at least for all those attending the welfare centres, whether they were expectant or nursing at the time or not.—Dr. Harry Campbell said that caries was absolutely preventable, and pyorrhœa largely so; if teeth were kept perfectly clean they would never decay. The food given to young children was often not of a kind to develop mastication; the greater part of the right sort of food belonged to the vegetable kingdom, and a considerable proportion of farinaceous food which compelled grinding should be provided.—Dr. Vincent Denne emphasised the importance of the hereditary factor in connection with teeth. Many women suffered from malnutrition owing to diseased teeth. Toxins from the teeth were absorbed, and the infant was not only badly nourished but poisoned. A number of women were unable to suckle their infants; they could not elaborate the ingredients of breast-milk because they were damaged by bacterial infection. There was no reason why fillings should not be carried out at any time during pregnancy and extractions until quite an advanced stage, if proper precautions were taken.

A CHEQUE for 100 guineas has been sent to the New Health Society by a firm of cigarette manufacturers as an expression of regret for having inadvertently included in an advertisement a photograph of Sir W. Arbuthnot Lane.